



**Emergency
communications**
saves lives
SEE PAGE 48



Rural utility
marries technologies
successfully
SEE PAGE 52



Interoperability
comes together
in Washington
SEE PAGE 28

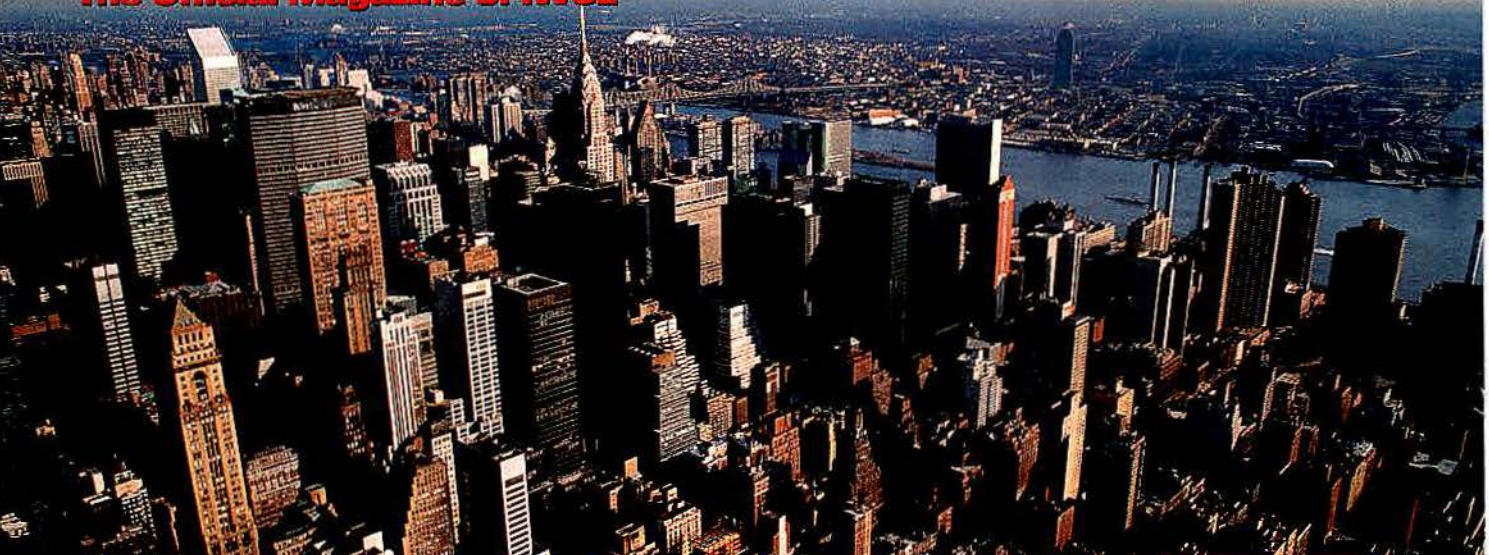
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OCTOBER 2002

MOBILE RADIO TECHNOLOGY

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IT CAN BE FIXED

A year after the tragic radio communications debacle of Sept. 11, a McKinsey & Co. study reveals that FDNY radios would work reliably in only a fraction of New York City's more than 2,000 high-rise buildings. What must New York do?

The answers begin on page 20.

SPECIAL ISSUE: Homeland Security

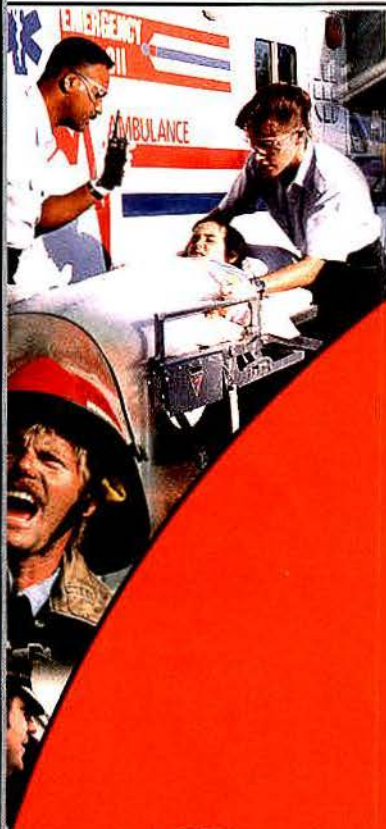
Exclusive: Researchers at Federal Sources Inc. look at the proposed federal homeland defense department and examines what it might mean for the information technology marketplace.

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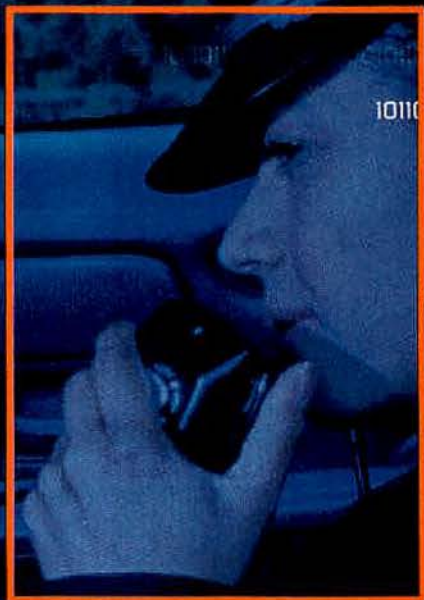
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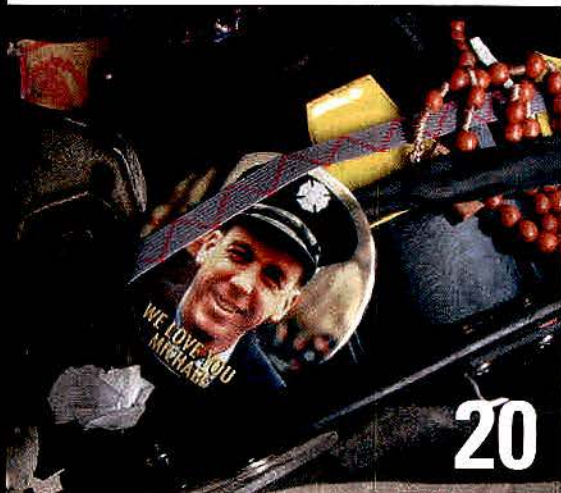
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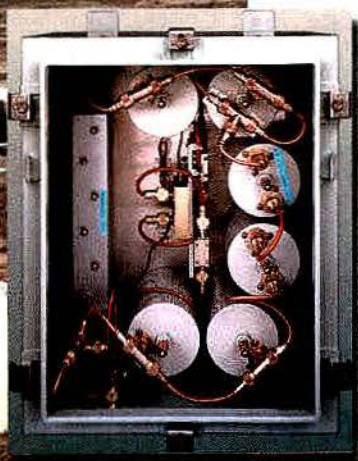
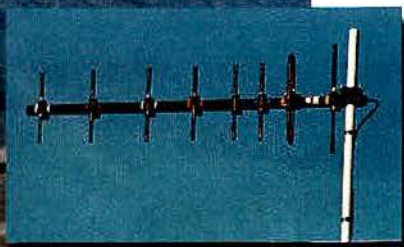
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Improve FDNY radio communications

The Fire Department of New York and the New York Police Department asked McKinsey & Co. for an investigation, an evaluation and recommendations in connection with their rescue response to the fires and building collapses at the New York World Trade Center caused by the Sept. 11, 2001, terrorist attack.

The fact that they asked individually means they didn't feel the need for even a veneer of inter-departmental cooperation. And the reports themselves blame the lack of cooperation for some aspects of the rescue effort that could have been improved if the two departments had worked more closely together.

McKinsey recommended greater use of the Incident Command System, a model for controlling emergency responses that involve multiple agencies.

But ICS could place a fire department official in command of the police, or vice versa, something both the FDNY and NYPD resist at the highest level – their commissioners.

Fire and police department officials normally have good reasons for doing things the way they do. For example, they use radio communications differently, and the technology they need for their communications differs.

The McKinsey report for the FDNY pointed out that the fire department's radio technology proved inadequate to handle the volume of radio calls and to send signals into the higher levels of the World Trade Center towers consistently, reliably and verifiably.

On the other hand, NYPD's radio sys-

tem, even as it was damaged in the terrorist attacks, proved adequate to that department's tasks.

Here's what will be difficult for the two departments, when it comes to radio communications and McKinsey's recommendations. McKinsey said that FDNY should "leverage" NYPD's radio system to support fire department communications in locations where coverage from the FDNY system may be lacking.

The expected fire department deployment of UHF radios that could be programmed with NYPD frequencies will make such leveraging technically possible.

But what's technically possible isn't always practical. In this case, practicality would involve planning at the management level and training at the firefighter level that may be difficult to achieve.

Moreover, the two departments' commissioners would have to want to share communications capabilities when sharing might better serve the response to a large-scale emergency, and it isn't clear that they do.

Keeping in mind that funding remains a key concern in a city facing a huge budget deficit, FDNY and NYPD leadership should pursue the resources for change, and then act to improve the fire department's radio communications capability.



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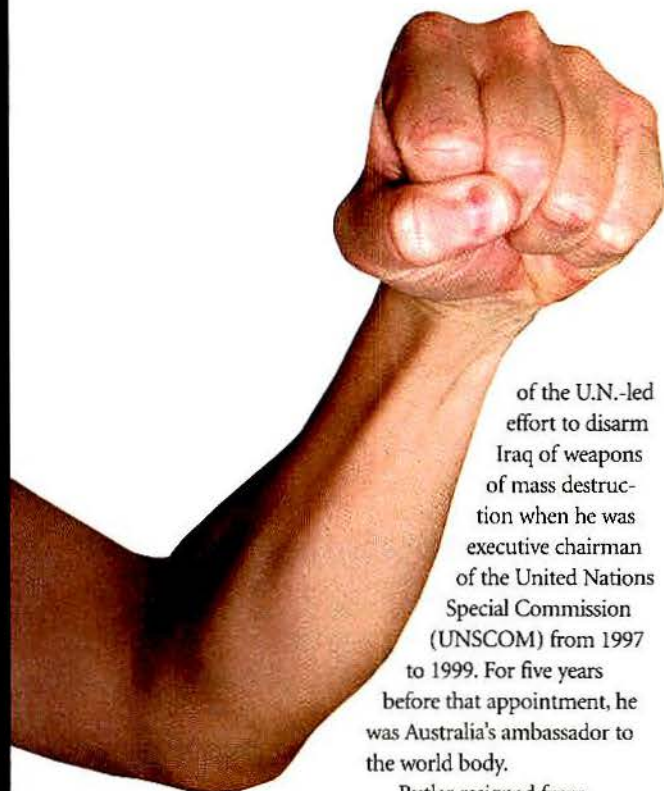
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Bare-knuckle tactics

IWCE inspects homeland security; announces keynote speaker



of the U.N.-led effort to disarm Iraq of weapons of mass destruction when he was executive chairman of the United Nations Special Commission (UNSCOM) from 1997

to 1999. For five years before that appointment, he was Australia's ambassador to the world body.

Butler resigned from UNSCOM on June 30, 1999. UNSCOM's operations in Iraq had been suspended after U.S.-British air and missile attacks in December 1998.

Residing in Australia, Butler is on leave from a post as diplomat-in-residence at the Council on Foreign Relations, New York.

Speaking on Australian television on Sept. 22, Butler said that he believed that the Bush administration "has decided to attack Iraq with the view to removing Saddam Hussein," although the Bush administration had said that no decision to launch an attack has been made.

"I think it was due to happen about now, but the prob-

lems in Israel – between Israel and the Palestinian people – set that timetable back. I think it's not a question of what will happen, but when. I suspect now that will be later this year or, more likely, early next year," he told Glenn Milne, chief political correspondent for the program Sunday Sunrise.

As to whether Australia should be involved in such an attack, he said that a decision to participate should be "for the right reasons, not just to fulfill some American objective, but in completion of international law. If Saddam has refused, once again, to have weapons inspectors back there and is still making weapons of mass destruction, I think it's legitimate for enforcement action to take place. Australia may well want to be a part of that, but not for the wrong reasons. Whatever we do, we should do it for the right reasons."

Butler also talked about a third deployment of Australian troops to Afghanistan. He said that the initial phase of the war against the Taliban and al Qaeda is over, and the present need is for nation building. In that context, he expressed reservations about committing Australian troops on request of the Bush administration unless it would be in accordance with international law and principle.

Butler opposes the unconditional support promised to the United States by Australian Prime Minister John Howard.

"Just because you're in an alliance relationship with some-

one else, and no matter how well you think of them – and we do think well of the Americans, and this task that we've got to pursue now internationally – it doesn't mean that you give up your own integrity, your own independence, your own judgment," Butler told Chris Bath, the host of Sunday Sunrise.

The former ambassador said that the Australian government should make its own assessment of data connected with an American request for assistance and not simply say, "You asked, fine. Therefore, we'll follow."

Butler referred to a bill before the Australian parliament that contains a definition of terrorism, and said that it "goes too far," adding that "it goes well beyond anything even the United States has on the books in terms of defining what is terrorism."

Butler is an advocate of improved Australian domestic intelligence to identify terrorist threats and then make domestic security arrangements to defend against them.

He would like to see improved control over access by people and goods to Australian territory, along with increased international cooperation.

Moreover, Butler cautions that when sharing intelligence with other nations, Australia should be careful that others do not give the Australian government "tainted information just to get us to join in their effort.

Continued on page 18

Expanding its scope to include homeland security and an increased emphasis on public safety, the International Wireless Communications Expo set for March 12–14 in Las Vegas.

Richard Butler, a former Australian ambassador to the United Nations who also served as the international body's chief arms inspector in Iraq from 1997–99, has been selected to deliver the IWCE conference's keynote speech March 12.

Butler is best known to American audiences as the face

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Kenwood restructures; Wineland out

Kenwood Corp., Tokyo, is merging its North American subsidiary companies into one—Kenwood USA—and changing the executive management for the new combination.

Tom Wineland, president of the Kenwood Communications subsidiary, was set to leave the company at the end of October as part of the management shakeup.

A statement released by the company said that the merger would better serve the company's primary markets of land mobile radio communications, and mobile and home entertainment.

After the merger, two Kenwood USA divisions, Communications and

Consumer Electronics, will market products in the United States.

In addition to heading all of Kenwood's North American operations, Moriyuki Tamura will head the Communications Division, which will handle land mobile radio and amateur radio products.

Tamura relocated to the United States from Japan last month.

A Kenwood USA vice president, Bob Law, will head the Consumer Electronics Division, which will handle home and mobile entertainment products.

In a restructuring set for Nov. 1, the two land mobile radio-oriented North American subsidiaries, Kenwood Communications and Kenwood Systems, will be merged into Long Beach,

Calif.-based Kenwood USA.

Also merging into Kenwood USA are Kenwood Service, the North American service operation, and Kenwood Americas, which previously served as the holding company for the other four: USA, Communications, Systems and Service.

Kenwood USA already was the largest affiliate company of the Japanese parent corporation.

Founded in 1946 as a manufacturer of high-fidelity components and amateur radio equipment, Kenwood entered the land mobile radio market in 1983.

In a prepared statement, Tamura said the merger would enable the company to streamline its reporting structure to improve responsiveness and operating efficiency.

With the merger, Tamura's title will change from president

of Kenwood Americas to president of Kenwood USA.

Several managerial and mid-level positions are being eliminated for an estimated annual savings of \$1.2 million.

"These changes will strengthen global administration and bring top management closer to the market," Tamura said.

The Dow Jones newswire reported that, as of the end of September, Kenwood had reduced its worldwide workforce by 642, or 27 percent, from 2,367 six months ago.

The reduction stemmed from a rising value of the Japanese currency, making export pricing higher to foreign buyers, and from weak mobile phone sales.

In May, the newswire had reported Kenwood's plan to close four overseas plants.

PCIA becomes ... PCIA

The Personal Communications Industry Association, a membership organization in Alexandria, Va., has made changes to reflect its focus on the wireless infrastructure industry.

The organization will no longer use the "formal, spelled-out" version of its name, preferring now to be called simply PCIA.

The use of the organization's "tower owners and managers" membership section name, SOMA (Site

Owners and Managers Alliance) has been discontinued, with former SOMA members now being referred to simply as PCIA members.

PCIA represents companies that develop, own, manage and operate towers and other facilities for the provision of all types of wireless, broadcasting and telecommunications services.

Founded in the era of land mobile radio, continuing through paging and messaging's rise and fall, and transitioning from personal communications services to tower and antenna siting, PCIA has said that it has been instru-

mental in facilitating the emergence and growth of core wireless services by providing members with the expertise and support to address regulatory, marketplace and technical issues that have most effect on member businesses.

A statement from PCIA said that the backbone of wireless communication—tower and antenna siting, or wireless infrastructure—is one of the most vital telecommunications sectors. The association said that, as fundamental elements to the growth of all wireless communications, towers and

antennas are essential to the formation of carrier networks that transmit voice and data.

"PCIA has made the wireless infrastructure our primary focus because what these companies offer is not discretionary—it is a vital and essential part of all wireless communications now and moving forward. From federal level advocacy to hosting the only trade show for the industry, by the industry, PCIA is the only organization dedicated to year-round support and advancement of the wireless infrastructure industry," said Jay Kitchen, the organization's president.

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PWS names keynote speaker

Richard J. Sheirer will deliver the keynote speech, and Mark E. Crosby will receive an award at the Private Wireless

Summit set for Nov. 6-9 at the Marriott Wardman Park Hotel in Washington.

Sheirer is senior vice president of Giuliani Partners, New York. Crosby is president of Access Spectrum, Bethesda, Md., and is a former president of the Industrial Telecommunications Association. Together with USMSS and the Council of Independent Communications Suppliers, ITA organizes PWS.

"Sheirer will speak on leadership, passion, teamwork and courage, inspiring the audience with stories from his role in former New York Mayor Rudy Giuliani's administration," said Laura Smith, ITA's president.

Sheirer had a 34-year career in public service, serving most recently as commissioner of the Mayor's Office of Emergency Management in Giuliani's administration. He developed plans for the city's multiple-agency response to emergencies. He was responsible for coordinating rescue, recovery and clean-up efforts at the New York World Trade Center.

Crosby, the president of 700 MHz Guard Band manager, Access Spectrum, Bethesda, Md., since resigning from ITA in 2001, will receive an award

for "outstanding contributions to private wireless." Crosby had been named to head ITA, then called the Special Industrial Radio Service Association (SIRSA), in 1975.

"Through Crosby's leadership, ITA became a leading voice in the private wireless community, fighting hard for additional spectrum and rules that would enhance spectral efficiency of private wireless systems. He has been vigilant to help mitigate interference in the private wireless bands," Smith said.

During his tenure, the industry was allocated spectrum at 800 MHz, 900 MHz, 220 MHz and, most recently, the 700 MHz Guard Band.

"Crosby led the industry through the FCC's refarming proceeding, which narrow banded the spectrum below 512 MHz, and through the consolidation of the 20 radio services into two: Industrial/Business and Public Safety. He pioneered the concept of the guard band manager and worked with the FCC and the industry to make it a reality. In 2000, Crosby co-founded Access Spectrum, a guard band manager, and later left ITA and to become its president," Smith said.

"During Crosby's leadership, ITA diversified its membership, automated its processes, added spectrum management services and nearly doubled its staff. With Crosby at the helm, ITA gained FCC cer-

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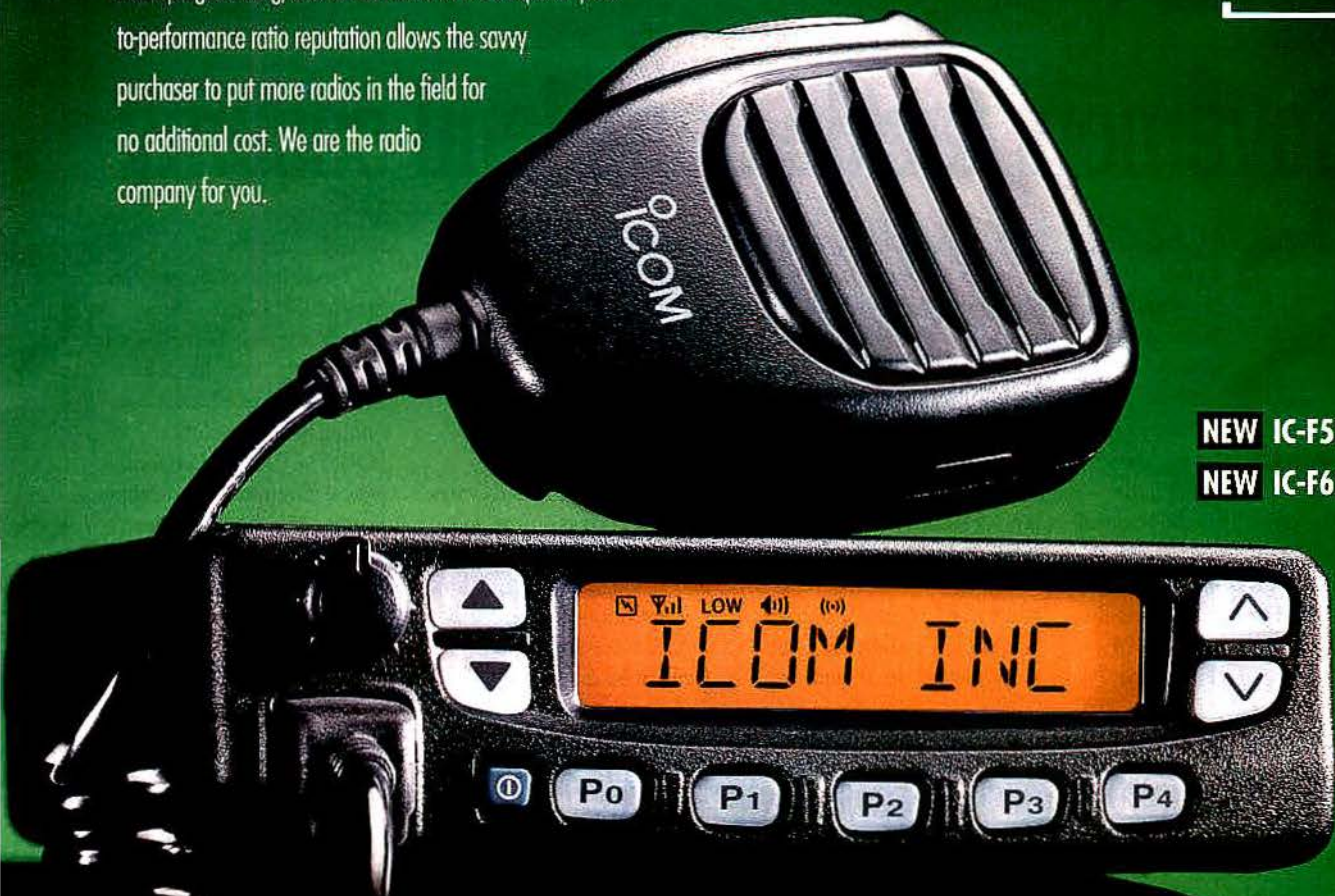
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tification as a frequency coordinator in the 800/900 MHz bands.

As a result, the membership of the association grew beyond the core Special Industrial Radio Service (mining, fuel oil delivery, pipeline maintenance, agribusiness, heavy construction, ready-mixed concrete) to include a cross-section of private wireless users, including airlines, express package delivery, oil and gas refineries, manufacturers, chemical firms and utilities, Smith said.

Smith said that Crosby aggressively expanded the asso-

ciation's services to include engineering, the PCS Clearinghouse and post-licensing conflict resolution.

In the mid-1980s, ITA opened an additional office in Gettysburg, Pa., near the FCC's licensing facility, to provide research services, and the associations said that it remains the only frequency coordinator with a permanent presence there.

The Gettysburg offices also serve applicants in the preparation of their radio license applications, a service that some say can only be lawfully provided

by attorneys.

"Also during Crosby's tenure, ITA fully automated its frequency coordination process. Most recently, we developed a Web-access coordination program, known as NetLicense2," Smith said.

"Given his leadership of this association over the last 25 years, as well as his many contributions to our industry during those years, it is clear to me that Mark Crosby should receive this year's award," said Smith.

PWS attracts private wireless users, radio dealers and

communication service providers. It features general sessions, training meetings and an exposition.

Subjects covered include private wireless regulatory issues, legislation initiatives, new spectrum opportunities and communications technology.

Additionally, several companies will be holding training sessions for two-way radio dealers.

For more information about PWS, visit www.ita-relay.com or call 703-528-5115.

Governors tackle homeland security

Saying that homeland security starts with "hometown security" the National Governors Association announced a series of initiatives on Sept. 19 at the National Press Club in Washington. The measures are designed to help governors protect their citizens and their states from acts of terrorism and reinforce the

less interoperability between states, local government, and law enforcement, fueled by federal resources and knowledge," said NGA Chairman Kentucky Gov. Paul Patton.

To spearhead the work, which includes pilot projects to enhance information sharing among local, state, and federal officials and to strengthen driver's license standards, NGA has formed a homeland security task force and named Utah Gov. Michael Leavitt and

help them improve sharing information among law enforcement agencies, corrections institutions and the courts; state homeland security directors and first responders; and public health agencies, hospitals and health labs.

"Since Sept. 11, 2001, states, all levels of government, and the private sector have sprung into action. But no matter how well-intentioned or how well-funded these efforts are, it won't make much of a differ-

he said.

The governors said they are hopeful that Congress will include several billion dollars in homeland security funds for states when it considers a continuing budget resolution (CR). The CR is needed for the federal government to continue operating because the House and Senate have not passed their annual spending bills.

"To date, the main costs of homeland security have been born almost entirely by state and local governments," Barnes said. "We cannot wait until next year for financial assistance from the federal government."

Also on Sept. 19, the governors released, "A Governor's Guide to Emergency Management Volume Two: Homeland Security," a reference document for governors and their staffs.

An electronic copy is available at www.nga.org/cda/files/govs-guidehs2.pdf.

"Since Sept. 11, 2001, states, all levels of government, and the private sector have sprung into action."

critical role states play in the structure and implementation of a national homeland security strategy.

"Homeland security is really hometown security. The battle against terrorism begins with first responders in our communities. We need a homeland security strategy that recognizes there must be seam-

Georgia Gov. Roy Barnes as its co-chairs. Delaware Gov. Ruth Ann Minner also will serve on the task force.

Leavitt issued a statement to say that state and local law enforcement and emergency personnel are critical to homeland security. He said that NGA's Center for Best Practices will select five to eight states to

ence if they're not all connected and communicating," said the governor. Leavitt managed a security force at the 2002 Olympic Winter Games and is a member of President Bush's Homeland Security Advisory Council. "The place for that to happen is at the state level, and NGA's new initiative will help us immensely in this endeavor,"



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SS-30	25	30	3 1/4 x 7 x 9 1/2	5.0

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SRM-12	10	12	3 1/2 x 19 x 9 1/2	4.7
SRM-18	15	18	3 1/2 x 19 x 9 1/2	5.0
SRM-25	20	25	3 1/2 x 19 x 9 1/2	6.5
SRM-30	25	30	3 1/2 x 19 x 9 1/2	7.0

WITH SEPARATE VOLT & AMP METERS

MODEL	CONT. (Amps)	ICS	SIZE (inches)	Wt.(lbs.)
SRM-25M	20	25	3 1/2 x 19 x 9 1/2	6.5
SRM-30M	25	30	3 1/2 x 19 x 9 1/2	7.0

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SRM-30-2	25	30	3 1/2 x 19 x 9 1/2	11.0

WITH SEPARATE VOLT & AMP METERS

MODEL	CONT. (Amps)	ICS	SIZE (inches)	Wt.(lbs.)
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SRM-30M-2	25	30	3 1/2 x 19 x 9 1/2	11.0

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SS-10MG, SS-12MG
SS-101F, SS-121F
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SS-10SM/GTX
SS-10SM/GTX, SS-12SM/GTX, SS-18SM/GTX
SS-10RA
SS-12RA
SS-18RA
SS-10SMU, SS-12SMU, SS-18SMU
SS-10V, SS-12V, SS-18V



MODEL SS-12SM/GTX



MODEL SS-10EFJ-98

EPA tags security plan

The U.S. Environmental Protection Agency has released its strategic plan for homeland security.

The plan is intended to support President George W. Bush's national strategy for homeland security and the efforts undertaken by the proposed new Department of Homeland Security.

Since November, EPA had been examining its homeland security mission in the context of its broader mission to protect public health and safeguard the environment. The agency evaluated its role in protecting against and responding to terrorist attacks.

The agency's plan identifies goals in four mission-critical areas. The plan is intended to serve as a blueprint for the agency's senior leadership on how to enhance EPA's ability to meet its homeland security responsibilities. The activities and initiatives in the plan represent an enhancement of EPA's capabilities to detect, prepare for, prevent, respond to and recover from terrorist incidents.

The plan represents one of many steps the agency took following the terrorist attack on Sept. 11, 2001, to ensure the agency's ability to fulfill its homeland security responsibilities. The new Department of Homeland Security or other agencies may eventually carry out some of the activities identified in the plan.

"As President Bush and [White House Director of Homeland Security] Governor Ridge have emphasized, we all

have a role to play in homeland security," said EPA Administrator Christie Whitman. "The EPA homeland security strategic plan is designed to ensure that this agency is doing what it should to meet its responsibilities as part of that effort."

"I commend EPA for their work on their homeland security strategic plan and hope that it will serve as a model for other departments and agencies," said Ridge. "As we continue our efforts to defend the homeland, it is important that we have well thought-out strategies so that our resources can be targeted to the most urgent priorities."

The goals of the plan are separated into four mission areas: critical infrastructure protection; preparedness, response, and recovery; communication and information; and protection of EPA personnel and infrastructure. The strategic plan lays out goals, tactics and results in each of these areas.

Whitman has signed a memorandum of understanding with the Edgewood Chemical Biological Center designed to enhance EPA's work with the center with respect to biological contaminants in water.

In coordination with the White House Office of Homeland Security, EPA is developing a national decontamination team, a cadre of specialized and experienced emergency responders, engineers and scientists dedicated to providing immediate technical decontamination expertise at the scene of a chemical, biological or radiological attack.

Over the past several years, various presidential decision directives and other orders have



EPA Administrator Christie Whitman and U.S. Rep. John Linder, R-Ga.

assigned EPA responsibility for some aspects of homeland security. These explicit responsibilities include being the lead federal agency charged with helping to protect the nation's water infrastructure from terrorist attack, being the lead agency responsible for the cleanup of any biological or chemical attacks, and having responsibilities connected with certain radiological attacks.

More recently, President Bush's national strategy for homeland security names EPA as the lead federal agency for reducing the vulnerability of the chemical industry and hazardous materials sector of our nation's critical infrastructure.

The agency is undertaking a "lessons learned" study to determine what the agency had done well and what things needed to be done better in response to the Sept. 11 attacks.

Since Sept. 11, the EPA has taken steps to ensure its abilities to meet its homeland security responsibilities.

The agency is adding 75 response staff personnel to strengthen its ability to respond simultaneously to multiple incidents. The agency is providing advanced training and state-of-the-art equipment to those who would respond to any chemical, biological, or radiological incident. It is establishing a new environmental response team in Las Vegas to provide a quicker response time to any incidents that may happen in the western United States.

EPA has awarded nearly \$50 million in grants to the nation's largest drinking water facilities to assess vulnerabilities and make security improvements. It has upgraded its Cincinnati facility to handle "level-three" contaminants.

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Rappaport wins Terman award

Theodore S. Rappaport, Ph.D., will receive the 2002 Frederick Emmons Terman Award of the Electrical and Computer Engineering



Division of the American Society for Engineering Education on Nov. 7 at the Frontiers in Education Conference in Boston.

Rappaport is a professor at the University of Texas and is chairman of Wireless Valley Communications, both in

Austin. The Terman award, sponsored by Hewlett-Packard, is given to "an outstanding young electrical engineering educator in recognition of the educator's contributions to the profession," the citation reads.

Rappaport has authored, co-authored or co-edited 15 books in the wireless field, including *Wireless Communications: Principles and Practice*, which is in use at more than 100 universities and many companies. He founded and directed a wireless research and educational group, the Mobile and Portable Radio Research Group, at Virginia Polytechnic Institute and State University, Blacksburg.

Since moving to Austin this year, Rappaport has founded a new wireless program, the Wireless Networking and Communications Group, at the University of Texas.

"In what has only been a few months, we now have a critical mass of faculty and students, and it's just the beginning," Rappaport said.

Rappaport is a Fellow of the Radio Club of America, New York, and as a college student, he received a scholarship from the club.

Continued from page 8

Of course, I'm thinking of the United States. We've got to have our own independence of mind there because Australian lives are at stake."

He also advocates the continued development of international law on terrorism, includ-

ing the elements of how to combat it and how to obtain international cooperation to ultimately eliminate it.

The war on terrorism has led to concerns about civil liberties in the United States, and Butler's interview on Australian television indicated a corre-

sponding concern that increased intelligence-gathering supported by the Australian parliament's pending terrorism bill might impinge on civil liberties in Australia.

Butler told Milne, "Intelligence gathering within Australia is in pretty good

shape. I'm talking about extending the reach of it to see where terrorism is going to come from – from overseas sources. There is always the possibility that increased intelligence capability could begin to encroach on our civil and privacy rights. We have to be vigilant about that."

Briefs

The Press-Republican, Plattsburgh, N.Y., reported that Clinton County would spend \$600,000 to upgrade E911 dispatch and radio communications with an 800 MHz system that would be compatible with the state's planned Statewide Wireless System.

The Fauquier Citizen, Warrenton, Va., reported that the Fauquier County sheriff, Joe Higgs, said that when Deputy Sean Healy was shot in the neck on Aug. 31 during a routine traffic stop, his VHF hand-held radio did not work as he lay by the roadside and attempted to call for help – lending urgency to the installation of a new 800 MHz system.

Beginning in November, Uniden Corp. of America, Fort Worth, Texas, expects to ship radio scanners that can receive signals that use the Project 25 digital standard, now that the scanners have received FCC certification.

The Durango (Colo.) Herald reported that a state revenue shortfall would delay the completion of a statewide 800 MHz radio system from the end of 2005 to the end of 2006.

Business use of Family Radio Service two-way radios would be barred if the FCC grants a petition filed Aug. 22 by the Industrial Telecommunications Association membership organization, Alexandria, Va. The FCC accepted comments on the petition until Oct. 17.

Citing security concerns, the Department of Defense is barring the use of many types of wireless communications in the Pentagon and in parts of several military branches except for "land mobile, emergency, and tactical radios and one-way receive-only devices."

The Odessa American reported that the Odessa, Texas, city council has voted to allow the University of Texas of the Permian Basin police department to tie into the city's radio system. UTPB police would purchase 12 radios and pay \$10 a month to use the city's 800 MHz radio system "only if there was some emergency in the city or at UTPB so they needed to talk to the Odessa police," said Odessa Police Chief Chris Pipes. Otherwise, "they'll have their own channels to use in their business," he said.



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What the McKinsey report says about FDNY radio communications

by Don Bishop

Better radio communications could have saved some of the 343 firefighters who perished in the collapse of the New York World Trade Center towers. That's the contention of the Uniformed Fire Officers Association, a union that represents about 2,500 captains, lieutenants and battalion chiefs among the Fire Department of New York's 11,500-member department.

"One of FDNY's staff chiefs gave an order to evacuate the north tower, and 56 minutes transpired from the time he gave the order to when the tower collapsed, and no one heard the order. We lost 120 firefighters in the building," said FDNY Lt. Steve Carbone, the vice president of UFOA.

UFOA President Peter Gorman issued a demand during an August news conference that FDNY replace the aging VHF hand-held portable two-way radios that were in use on Sept. 11, 2001.

Early last year, the department had replaced its older 3,000 VHF analog radios with 3,800 UHF dual-mode, digital-and-analog radios that were set to digital mode. But by March 2001, the UHF radios were withdrawn because of what Gorman said were complaints about inadequate coverage. The department re-deployed its older VHF radios, which then were in use on Sept. 11, 2001.

Gorman has called for a grand jury investigation of what he described as the failure of the UHF radios and the resultant delays in replacing the old radios. On Sept. 11, 2001, and continuing until the time of Gorman's press conference 11 months later, FDNY was still using the old radios he described as "inadequate."

How much it will cost

The McKinsey report gives some estimates for improving fire department communications in high-rise buildings and EMS communications for tracking patients. These are the key dollar figures:

\$1-2 million

portable or mobile repeaters

\$150-250 million

radio communications infrastructure (repeaters, cables and other technology)

\$6 million

radio infrastructure in Battery, Holland, Lincoln and Midtown tunnels

\$2-4 million

improved patient tracking by EMS

The company that manufactures the radios, Motorola, said that both the old and the new radios work fine—but without radio infrastructure, no portable two-way radios can achieve the coverage that the union wants. Portable radio signals normally cannot pass through multiple floors of a high-rise building without a signal-boosting network infrastructure.

"The laws of physics haven't changed. It's not the radios, it's the network behind the radios," said John McFadden, Motorola's vice president of major system sales for the company's northern division.

FDNY asked McKinsey & Co., a management consulting firm, to look into various aspects of its response to the terrorist attack, including its communications. The McKinsey report doesn't speak to any possible fault of FDNY's portable two-way radios, instead focusing on how to test them, and then to either deploy the new radios or replace them. But the report covers an evacuation order given by radio to firefighters in the World Trade Center.

"Firefighters and fire officers on the upper floors of the north tower (WTC 1) did not hear an evacuation order given by radio after the south tower (WTC 2) had collapsed. In some cases, these firefighters were told by other firefighters that the evacuation order had been issued," the McKinsey report reads.

The McKinsey report doesn't agree with Carbone's statement about the evacuation order timing. The report said that the evacuation order for WTC 1 came after the collapse of WTC 2.

"Prior to searching for an exit himself, B1 (chief of Battalion 1) issued an order at approximately 10 a.m. over the portable radio for all FDNY members to evacuate WTC 1," the report reads.

Carbone recalled FDNY's response to an earlier terrorist attack.

"In 1993, terrorists bombed the World Trade Center. From that moment on, it was realized that our radios didn't work in the World Trade Center. They had to use runners to get messages back and forth from the command post," Carbone said.

McFadden said that the problem with the portable radio communications stemmed from the extraordinary number of radio calls being made by a large number of firefighters on one channel in the area of the World Trade Center. Normally, only a relatively small number of firefighters would be communicating in such a small area.

The fire department has seven VHF channels. Six channels have repeaters. Each borough has its own repeater channel for dispatching, and the remaining channel with a repeater is used for city-wide dispatching.

That leaves one non-repeater channel, a channel designated F1, for communications among firefighters on the scene of an incident. Until New York City had an emergency on the scale of the World Trade Center, using only one channel in this way normally worked well.

Communications between fire units and dispatchers are relayed through repeaters; communications among firefighters on the scene of an incident—the "fireground"—are not. Among the firefighters, the radio signal travels directly from portable radio to portable radio in a mode called "simplex" or "takaround" by other radio users, and "fireground" by fire departments.

On a fireground channel, the fire chiefs and the firefighters can talk among themselves in a localized area,

normally without interfering with any other units at other incidents. The reason is because the low-power (1 W) VHF portables' radio signals do not carry far.

The simplex mode is often preferred for fireground operations because channel access is immediate and, typically, personnel may be in locations no within operating range of a network or repeater.

When fighting most high-rise fires, the typical mode of operation involves placing the incident command point in the building lobby where the command officer would have access to the building's wired communications system that McFadden explained is required by law.

"Then, wearing breathing apparatus, the firefighters move to the floor below the fire and fight the fire as a team. For 20 or 30 years of fighting such fires, the 1 W radios were sufficient. On Sept. 11, 2001, that changed dramatically," McFadden said.

McFadden recalled the CBS-TV documentary *9-11: Camera At Ground Zero* by French filmmakers Gedeon and Jules Nadet and described how the camera followed the fire chief into the lobby of WTC 1.

"You see the communications, the first responders, talking on their radios. They're starting to get organized, going up the elevator and the steps. Then the second plane hits. They have to split their command, and you can see the volume of two-way radio on the air accelerate," McFadden said.

"At that point, it got harder for the firefighters to get things done. Nothing they had planned involved fighting fires in two-high-rise buildings next to each other," he said.

Michael Patsalos-Fox, head of McKinsey's New York office, wrote in an Aug. 21 editorial in the *New York Daily News*, "New York's Fire and Police Departments are the world's best, yet no police or fire agency could have anticipated the chaos and destruction of Sept. 11, 2001. We found that the fire and police departments sacrificed many lives facilitating the safe evacuation of more than 25,000 people, the largest rescue operation in U.S. history."

McKinsey is a privately held consulting firm with 2001 revenues of \$3.1 billion. Company spokesperson Andrew Giangola said that the company handles about 200 projects per year for non-profit and public sector clients to the

tune of about \$100 million worth of donated time.

New York's Fire Commissioner Nicholas Scopetta and Police Commissioner Raymond Kelley separately asked McKinsey to look at their departments' responses to the Sept. 11, 2001, terrorist attack and recommend changes.

Some people have suggested that the heroic spirit that exemplified the firefighters' efforts to help the public might have caused some of them to ignore their own evacuation order even if they heard it.

That suggestion figures into the report's conclusion that some lapses of fire department discipline in the face of overwhelming desires to participate in rescue efforts led to some firefighters and officers to fail to coordinate their deployment with incident command, placing themselves at greater risk. Along with its recommendations for improved communications, the report calls for the department to more clearly delineate the roles of firefighters and officers, and to improve the clarity of the chain of command.

ISSUE: Radio coverage in high-rise buildings

New York City has about 2,000 high-rises—buildings with seven stories or more.

The McKinsey report said that field experience suggests FDNY personnel can communicate reliably in only a fraction of these buildings. The management consultant said that, to address this shortcoming, FDNY should immediately evaluate, acquire and deploy equipment, together with the associated procedures and training.

"High-rise communications gaps can be addressed with the deployment of repeating infrastructure that receives, amplifies and retransmits radio communication signals to improve coverage. Repeaters that are portable, mobile (truck-mounted), or air-based (deployed on a balloon) may help to mitigate in-building communications difficulties, but do not provide full coverage for high-rises," the report reads.

The McKinsey report said that stationary repeating infrastructure can support reliable communications in most cases when designed, installed and maintained properly. This kind of infrastructure can be installed inside or outside of a building.

The management consultant suggested that FDNY pursue all of the available

high-rise building radio communications solutions, and to do it along two parallel and complementary paths:

Test and deploy portable, mobile and air-based repeaters — McKinsey said that FDNY should complete rigorous tests with portable, mobile and air-based repeaters to develop and document guidelines for optimal use of this equipment (e.g., where to place the equipment for best coverage, which combinations of equipment types are most effective).

"FDNY should also develop an understanding of the limitation of this equipment. Once guidelines for optimal use of it are established, the fire department should acquire appropriate equipment, train personnel to use it, and deploy it," the report reads.

McKinsey estimated that deployment of portable or mobile repeaters by FDNY would cost \$1 million to \$2 million and could be completed within six months.

New York City, through its Technical

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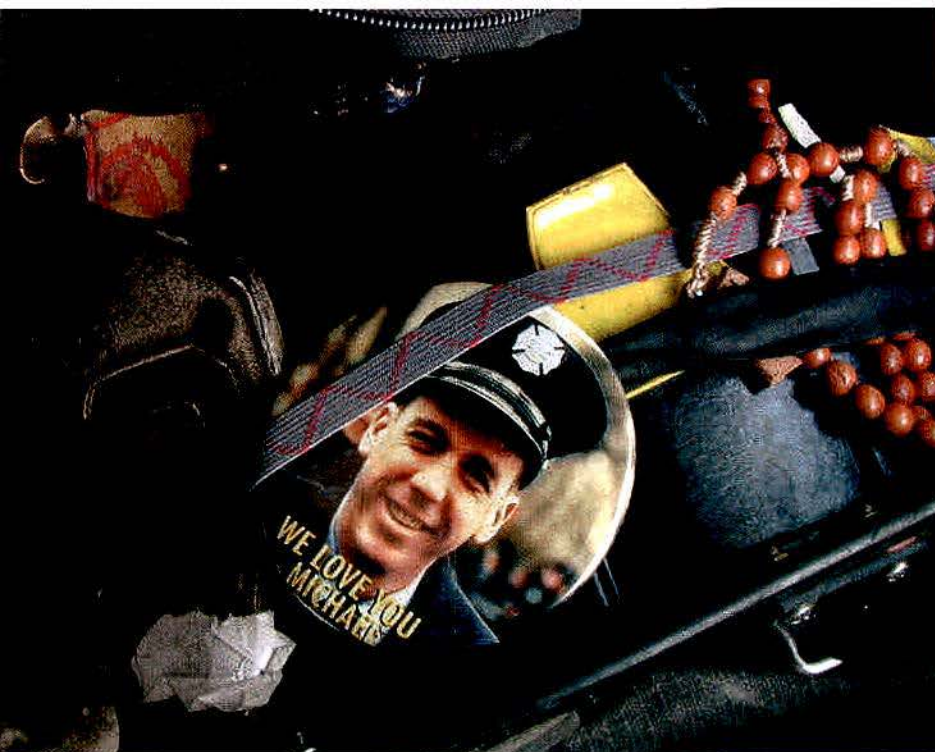


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Assistance Response Unit in the police department, has tested a portable repeater linked by 2.4 GHz microwave to a JPS Communications ACU-1000 computer-controlled cross-connect. The portable repeater can be carried to a position near the fire in a high-rise building to communicate with portable radios used there, and the microwave links it to a radio interface at the base of the building to extend communications to portable radios used there.

Mobile repeaters mounted on pumpers or aerial ladder trucks may or may not be effective, because sometimes the fire apparatus must be deployed in positions that are unfavorable for the repeater. Trailer-mounted repeaters could be separated from their transport vehicles for improved positioning when necessary.

Pursue stationary communications infrastructure — In addition to accelerating deployment of portable, mobile or air-based repeaters, the FDNY must foster the deployment of stationary repeaters that will ensure that its personnel and New York City's other first responders can communicate reliably in high-rise and other large buildings. As the second path to effective high-rise communications, the McKinsey report recommended that FDNY take three simultaneous steps.

Step 1: Require high-rises to support first responder communications.

The management consultant said that FDNY should develop and seek adoption of changes in the city building code requiring that all New York City high-rise and other large buildings, existing and new, support first-responder communications needs. The code should not mandate a specific technology or solution, but should require that minimum performance standards for communications be met.

One possible solution could be the installation of fixed, building-specific repeaters.

"The city should consider establishing a subsidy system to give incentives to owners of existing buildings to expedite compliance with the new building code. Such subsidies should be structured to reward speed of deploying equipment and cost-effectiveness," the McKinsey report reads.

McKinsey estimated that deployment of this infrastructure for all high-rises in the city would cost \$150 million to \$250 million and could be implemented within three years.

Step 2: Evaluate the deployment of additional city-owned infrastructure.

The management consultant said that the most cost-effective way to ensure in-

building high-rise radio coverage could require a mix of solutions. An alternative or complementary solution to building-specific solutions might be a citywide radio infrastructure that would be owned and operated by the city or one of its agencies.

McKinsey recommended that FDNY develop and issue an RFI/RFP for building such an infrastructure.

"The RFI/RFP should be written so that the city may determine the capabilities and performance of this infrastructure, along with the costs to deploy and operate it, and the likely time necessary for deployment. The RFI/RFP should also allow for the possibility of purchasing new end-user radios, including radios using different technologies and standards than the VHF and UHF radios currently owned by the FDNY," the report reads.

Step 3: Try to leverage the NYPD's infrastructure to meet FDNY's needs.

The management consultant said that FDNY should work together with NYPD to explore whether—and how—the police department's citywide communications networking infrastructure could be used to support all or some of FDNY's communications needs.

McKinsey said that the RFI/RFP it recommends for the fire department infrastructure could be used to determine whether a common NYPD and FDNY communications infrastructure would be more effective for the city, rather than two separate police and fire networks.

"The FDNY should work with the NYPD to understand which facilities and assets (e.g., sites, towers, transport capacity, and power equipment) currently owned or operated by the NYPD can be easily shared with the FDNY in ways that would benefit both departments—should the FDNY or the city decide to deploy additional network capacity," the report reads.

ISSUE: Testing FDNY's new two-way radios

In 1999, FDNY purchased 3,800 Motorola XTS 3500 dual-mode UHF radios that were programmed to operate in digital mode.

"FDNY wanted digital because of the department's future plans for data communications," said John McFadden, Motorola's vice president for large project sales in the company's northern division.

Steve Carbone, vice president of the Uniformed Fire Officers Association, had little good to say about the original testing and the current testing.

"Before these radios were put out in the field, they were not tested properly. They were tested by some people in headquarters on the eighth floor in suits, and they said they worked."

The McKinsey report said that a first attempt to deploy the radios in early 2001 was unsuccessful. The report did not say why, but McFadden offered some history.

"Under the previous administration [of Fire Commissioner Thomas Von Essen], FDNY took back all 3,000 VHF radios and handed out the 3,800 new radios. The extra 800 were given to some firefighters in job categories that previously didn't have radios," he said.

"When firefighters working a fire use their radios, they're all on the same frequency, talking radio-to-radio, not going through a repeater. Usually about half of the firefighters have radios, so if 50 are at a fire, 25 will be using radios. Only one can transmit at a time, communicating one-to-many," McFadden said.

"If a firefighter calls an officer and he calls back, everyone hears it. There may be firefighters in the back of a building, on the roof and at the sides. They're working the fire and using the radio to call for more hose, or maybe a chief is trying to talk with a firefighter. The result is a certain amount of one radio signal stepping over another," he explained.

"If two or three tried to transmit at once, the others heard interference. That's what you get in analog: static or pieces of conversation. The firefighters came to rely on that static as a feature to tell them that someone tried to say something and couldn't be heard. So they would listen to see if someone was in trouble," McFadden said.

But McFadden explained that a feature of digital receivers is that they won't allow interference to get through.

"With digital, if the signal is not readable, the receiver is quiet. Or if one person is talking, the other signals are quiet-

ed out. The firefighters were not used to that," McFadden said.

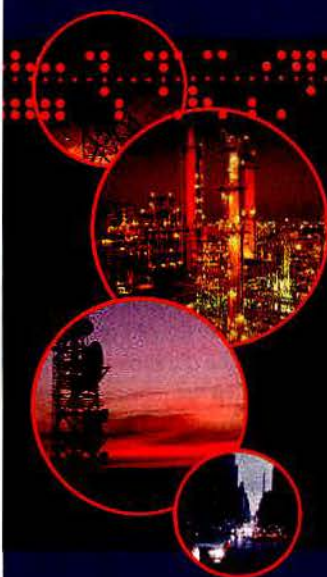
The firefighters were not told how the UHF digital radios would sound different and work slightly differently from the VHF analog radios.

"The department sent a video about the new radios to each firehouse. That was the training. The assumption was that firefighters had been using radios for 30 years, all on one frequency with

push-to-talk, and the new radios were not different," McFadden said.

Carbone said that a firefighter in the New York City borough of Queens became trapped and made a "Mayday" call for help on one of the new digital radios that was not heard by nearby firefighters. Instead, a pumper operator three blocks away heard the call, ran to the building, and alerted firefighters there. It's possible that interference, dif-

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fering signal levels and the digital feature blocked the firefighter's distress call nearby, yet allowed it to be heard farther away.

The incident led the department to remove the UHF radios and re-deploy the VHF radios.

The McKinsey report said that, although FDNY must evaluate the new radios' performance, "they do have several features that could give them significant advantages over the deployed VHF portable radios. They support a larger number of channels, providing an opportunity to fit fire, EMS and interagency channels, including NYPD channels, on the same radio."

The McKinsey report said that the new radios usually reach further inside structures, and they can be used in conjunction with the new Police Radio System now being deployed for the subways.

"All these features suggest that deployment of these radios could improve the communications capabilities of the FDNY, but only if they pass rigorous testing and evaluation," the report reads.

The latest round of testing for the new radios has begun.

"They're testing all over the city and finding that in subways and high-rises, the radios don't work. So what the department has done is to take the radios to Staten Island, a residential area, for testing," Carbone said.

"Naturally, the radios work there. They're going to field-test 400 of them, and if they pass muster they're they will

hand them out to the field. I'll be interested to see what happens in Brooklyn, Queens, and Manhattan in subways and in hundred-story buildings," he said.

McFadden said that the new radios were being tested in several ways.

"The fire academy has been testing them for months. Every weekend, the fire department takes them into high-rises and tests them. They look to determine whether the new radios can talk back and forth where the old ones did. They take two of the old radios and do a test count, and then the new radios and do a test count. No one has said that the new radios would perform well in subways or high-rise buildings without repeaters," he said.

A second way the radios are being tested involves a pilot project on Staten Island, where radio-to-radio performance is being tested," McFadden said.

"Staten Island is not indicative of the rest of New York City. But the advantage is that Staten Island doesn't do a lot of mutual aid with Bronx, Brooklyn, Manhattan and Queens, the way the other boroughs do with each other. For example, a pilot project in Brooklyn would require radios to be changed out in the Bronx, too,"

McFadden said that the object of the testing is to make sure that everyone, including the union, is confident of how the UHF radios work.

McFadden said that, if and when they are re-deployed, the new UHF radios would be programmed in analog mode on the fireground frequency so that the way they sound and work would more

closely resemble the VHF radios. The digital mode with its other features would be used on other frequencies.

ISSUE: Portable two-way radio procurement

Steve Carbone, vice president of UFOA, has expressed concern regarding the way the department's UHF portable two-way radios were purchased in 1999. These are the radios that were deployed early last year, only to be removed from service a short time later.

"FDNY purchased these radios without competitive bidding, which is mind-boggling, because you'd be hard pressed to buy a toilet seat in this city without competitive bidding," he said.

"We are trying to get the media to realize that someone in the Giuliani administration or FDNY's Von Essen administration took it upon himself to purchase these radios without bidding and without proper field testing," he said.

"There are others who make these radios. Why didn't we compare them? Maybe they're better quality, but we don't know that because no one has tested them," Carbone said.

Carbone said that representatives of the radio manufacturer, Motorola had visited the union to speak with its president, Peter Gorman. He said that they told the union that they wanted to address the problems that the department was having with the radios and what they thought the solutions were.

"We had the feeling that we were

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being placated. I can't get away from the question, and it's true, if you want to sell the city toilet seats, they will bid to all the toilet seat manufacturers, and someone will get that bid. They didn't do it with these radios," Carbone said.

John McFadden, Motorola's vice president of major system sales for the company's northern division, said that FDNY only gets an opportunity to replace its radios every 15 or 20 years. He said that most of its portable radio equipment is about 15 years old, with some of it as much as 25 years old.

McFadden explained that a few years ago, FDNY department decided to replace its old radios with the newest technology. At that time, New York City public safety agencies had gained access to 124 new radio frequencies contained in UHF-TV channel 16, which is not used for TV broadcasting in the New York City area. The police department has adjacent frequencies, so moving FDNY to UHF opened the possibility for interoperable communications with NYPD.

McFadden said that FDNY was assigned 20 UHF channels, increasing its capacity compared to VHF, and the department initiated plans to replace its VHF infrastructure.

McFadden said that the city originally used a price book contract for the VHF radios that established a bulk price under competitive bidding and a vehicle for subsequent purchases so that they don't

have to go out to bid each time.

"They were using Sabre VHF radios. We no longer make them. You can replace the radios on the contract on two conditions. First, the replacement radios must meet or exceed the technical specifications. Second, they have to have the same price. With the XTS 3500 dual-mode radio, we gave them a superior radio and held the price. That's how they

got this radio" under the existing contract without a new bid, McFadden said.

When the procurement was protested a couple of years ago, McFadden said, a primary election to select candidates for city government, including mayor, was approaching.

"The city council held hearings about the radio purchase and then concluded that the fire department had followed the long-established procurement policies," he said.

McFadden said all 3,800 radios were tested to meet specifications, including submersion in 6 feet of water for three hours.

"These radios have to be waterproof, not water-resistant. They didn't want to put something out there that after three or four fires would get water in them," he said.

"But FDNY didn't do operational testing. The city spent time testing the radios' durability and hardly any time teaching the users how the radio sounded different," he said, referring to the difference in the way digital radios receive signals compared to analog radios.

Prior to a possible re-deployment, the dual-mode radios have been set to analog mode for fireground communications so they would sound more like the previous VHF radios. ■

McKinsey's redeployment plan:

1. Finalize the codification of FDNY operational communications needs and the related technology features of these radios. For example, decide which of the following two features is more important: increasing the power output of transmissions over the command channels vs. the corresponding decrease in the radio's battery life.
2. Establish a detailed testing procedure and a comprehensive testing plan to determine if the radios meet FDNY's operational needs better than the current radios, without compromising personnel safety. The testing plan should ensure proper, rigorous documentation of the results of the tests.
3. Based on the test results, decide whether to deploy the radios.
4. If the radios fail the tests, seek alternative solutions, including issuing a new RFP. If they pass, update communications protocols and procedures as necessary to effectively deploy them.
5. If the radios are deployed, develop and implement a comprehensive training plan that ensures FDNY personnel are fully aware of the features of the radios and know how to use them effectively.
6. Deploy the radios into the field with appropriate performance tracking and feedback mechanisms.

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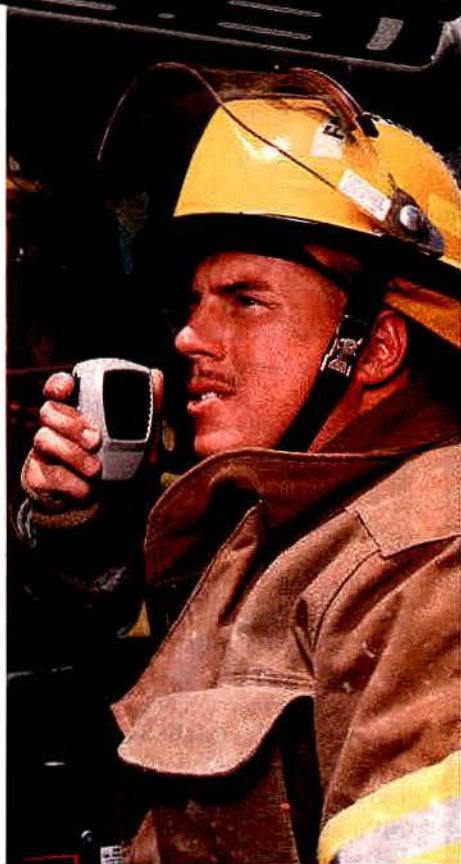
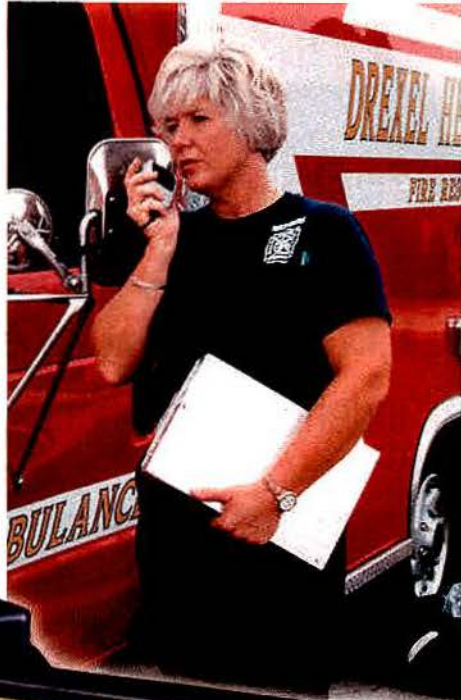


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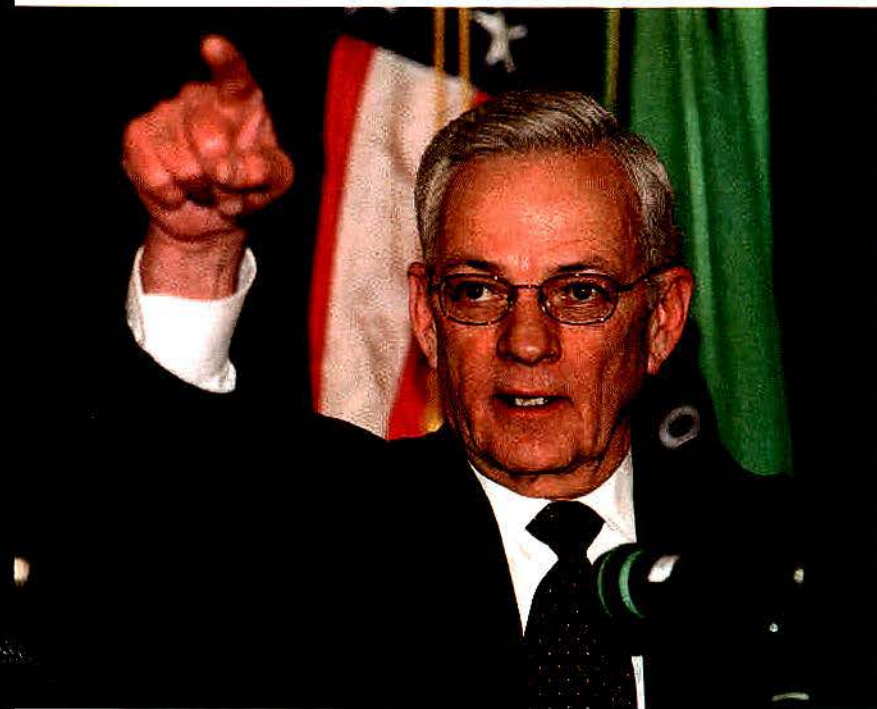
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Feds accelerate P-25 network

'Indefinite' contract carries more than \$3 billion estimate



U.S. Treasury Secretary Paul O'Neill

Federal law enforcement bureaus weren't just sitting on their hands about radio interoperability before the terrorist attacks on Sept. 11, 2001, and the effort that followed to establish a cabinet-level Department of Homeland Security with its promise of funding.

Many government entities already had projects under way. One of the biggest, the Integrated Wireless Network, includes law enforcement bureaus within the U.S. Departments of Treasury and Justice.

On Sept. 13, Treasury announced that the two departments had awarded a contract to six land mobile radio manufacturers for subscriber equipment to be used on the network.

Equipment purchased under the contract will include portable and mobile radios,

portable repeaters and base stations, encryption key loaders and ancillary support accessories.

The announcement described the contract as "multiple awards of indefinite-delivery, indefinite-quantity contracts with a combined ceiling amount of \$3 billion over a five-year contract life cycle."

The six companies named to supply Project 25 digital land mobile radio technology are Daniels Electronics, Victoria, British Columbia, Canada; Datron World Communications; Vista, Calif.; E. F. Johnson Co., Waseca, Minn.; M/A-Com, Lowell, Mass.; Motorola, Schaumburg, Ill.; and Thales Communications, Clarksburg, Md.

"An ID-IQ contract is a license to hunt," said Mike Blincoe, a vice president with the U.S. federal government markets division of Motorola Communications and Electronics. "It identifies vendors who can bid when a

purchase proposal is announced."

Blincoe said that an ID-IQ contract has no spending ceiling, but the government is required to estimate the value of the contract.

James Downes, assistant director of Treasury's Wireless Programs Office and co-program manager of the Treasury-Justice Joint Program Office, said that the two departments wouldn't be spending \$3 billion on the contract — not for Project 25 subscriber units — but he added that purchasing under the contract is available to other federal agencies. He said that his office already has seen some interest expressed in that regard.

Downes said the IWN would include about 2,500 repeater sites nationwide with as few as two or as many as 20 repeaters per site, depending on the coverage and capacity requirements. The user community will number at least 75,000 subscriber units.

A separate contract will be issued for Project 25-compliant trunked infrastructure and conventional repeaters. Downes said that the Joint Program Office is conducting a pilot test of infrastructure equipment in the Seattle area, representing the first roll out of IWN trunked infrastructure in the Northwest.

Treasury now operates about 1,800 sites, and Justice about 3,600, so IWN represents a consolidation and reduction of sites that Downes said has not yet been fully determined.

The reason is because the initial analysis was department-specific, and the "high-level" design does not address specific site requirements at the zone level.

Additionally, the two departments already use an undetermined number of sites in common, although with separate systems. He said that combining the two departments' efforts would significantly reduce the number of sites while enhancing

coverage "because the sum is better than any one piece."

IWN will be nationwide in the sense that it will be deployed in a number of cities with federal agency field offices and other required areas, but it will not offer nationwide geographic coverage.

The procurement of radio equipment from six manufacturers under one contract is a dramatic shift for the law enforcement bureaus within Treasury and Justice.

First, many bureaus previously used Motorola as their sole-source supplier. Prior to the availability of Project 25 equipment, only the one manufacturer was offering the encryption capability required by the federal government.

Second, each bureau previously had its own procurement process.

"The consolidated procurement helped each bureau to look at new ways of doing business and to consider what would be cost-efficient and good for all the bureaus, instead of focusing on single bureau activities," Downes said.

The effort to consolidate the communications systems and the procurement process began in the Treasury Department in September 1998 when Downes was the program manager for the wireless office. He has eight years with Treasury, having begun his work there as a frequency manager, following work with an engineering consulting firm.

Downes also worked for Motorola's service organization for three years, and spent 23 years in the military in positions involving land mobile radio communications before that.

"Like most of our federal brothers and sisters, Treasury identified Project 25 as our solution to move forward. Our self-imposed mandate within Treasury was to convert to Project 25, because we thought it was the best in the marketplace for interoperability and to establish a competitive marketplace. Those were our two major objectives," Downes said.

"Since we adopted Project 25 as our standard, anything we do has to be Project 25-compliant with forward and backward compatibility - to a degree," he said.

A statement issued by Treasury said that the two cabinet departments were taking "another step toward increasing information

sharing and synergy between law enforcement components. The standards-based technology will provide improved capabilities for law enforcement officers and agents from different agencies to communicate with each other in the field utilizing compatible land mobile radio subscriber units."

"The new Project 25 digital technology was specifically designed to improve communications interoperability among different government agencies and will greatly enhance coordination and cooperation among many different branches of law enforcement including ATF, the Customs Service, the Secret Service, INS, the FBI, the U.S. Marshals Service and DEA," a statement from Treasury's office of public affairs reads.

"Open lines of communication are vital to tapping into all of the government's resources when investigating illegal activity and protecting the homeland," a prepared



U.S. Attorney General John Ashcroft

statement from Treasury Under Secretary for Enforcement Jimmy Gurulé said. "Today's contract is another step toward increased cooperation and communication between law enforcement components."

The Project 25 standard activity has been pursued by a partnership among public safety radio users at various levels of government and industry to develop standards, based on user needs, for two-way radio equipment operating at VHF, UHF and higher bands. Project 25 has been adopted as a standard by various federal and state agencies in the procurement of radio equipment.

"The utilization of the standards-based open architecture provided by Project 25 will foster competition among manufacturers of land mobile radio equipment and systems, which should provide additional cost-effective solutions to both Treasury and Justice, as well as other government agencies

that utilize this contract vehicle," the Treasury Department announcement reads.

Making decisions based on what's proposed (Department of Homeland Security) is one thing. Making decisions based on what's at hand (NTIA's Jan. 1, 2005, deadline for narrowband conversion by federal VHF radio systems) is another.

Downes explained that the procurement is part of a project to consolidate various radio systems now operated by various federal law enforcement bureaus into the Integrated Wireless Network intended to upgrade communications and meet the NTIA narrowband conversion mandate. The planned IWN also is in accordance with the Project SafeCom initiative led by FEMA to enhance interoperability among the entire public safety community.

"The most exciting part of the IWN from a management point of view is that we not only brought our bureaus together, but we brought two departments with law enforcement missions together. We overcame some of our political issues for the sake of a common goal. In the long run, consolidation will benefit our law enforcement community, and we'll give them better communications than ever before. Taxpayer money will be spent smartly and efficiently," Downes said.

Downes explained that every bureau had been used to having its own radio program and budgets, and did business their own way, doing what was necessary to support their respective bureau requirements. He said it became apparent as federal radio users moved to meet the narrowband mandate and entered the digital environment necessary for encryption that sharing resources and infrastructure made sense.

"The bureaus would say that they lost a certain amount of control, but I think they would admit that the concept of the sum is greater than any one part. They've signed up for that as well. With IWN, no one bureau will have less than what they had yesterday, and in most cases, they will have more, with better coverage for the most part and enhanced interoperability," Downes said.

Prior to IWN, the federal law enforcement agencies sometimes shared repeater sites, but they had their own leases. The various agencies had joint frequency management, using NTIA licenses issued to

What they can do together

The Integrated Wireless Network will allow Treasury and Justice to:

- improve northern border security;
- reduce the number of infrastructure sites;
- meet OMB's Project SafeCom interoperability goals;
- install narrowband radios mandated by NTIA;
- eliminate duplicative efforts, most of which they won't reveal for operational security;
- provide a single-point gateway for state/local interoperable communications with federal law enforcement bureaus;
- purchase equipment on the most favorable terms, reducing taxpayer cost.

the various agencies.

The narrowband mandate only says federal agencies have to reduce from 25 kHz channels to 12.5 kHz channels. It doesn't specify analog or digital. But Downes said that the law enforcement community's need for encryption led to the digital choice, in part because no manufacturer was interested in pursuing what would be required for analog encryption – the DES NIST FIPS standard.

The lack of a suitable analog encryption alternative forced the federal agencies to go digital, but Downes said digital brought other features and enhancements, such as unit identification.

At the same time, the IWN project allows participating agencies to eliminate duplication of effort – “not manpower, because we're undermanned. But taking advantage of shared resources,” Downes said.

Downes added that, aside from funding, the most challenging aspect of the project is frequency coordination for any new narrowband channels made available in between any adjacent 25 kHz channels when they are converted to the narrower 12.5 kHz bandwidth.

“The narrowbanding is achieved by taking a 25kHz channel and slicing 6.25 kHz off of each side. Then a new 12.5 kHz channel is born in between those previous 25 kHz channels. But 20 years ago, we configured our assignments to avoid adjacent channels

to reduce the potential for interference. No one thought about a future narrowbanding mandate. In protecting ourselves then, we created a challenge for ourselves now,” Downes said.

“To use the new 12.5 kHz channel, you find out who occupies the 25 kHz channels on either side of yours and ascertain whether they already made their narrowband transition. The biggest challenge for the frequency management staff in my office coordinating frequencies as we narrowband our channels to find new narrowband channels that we can use,” Downes explained.

Although law enforcement bureaus make use of wireless telephones, including cellular and PCS, Downes said that there are several reasons why the federal government sees enormous value in maintaining a land mobile radio system.

“First, radio has coverage where there isn't much population, such as remote border areas. The wireless carriers have no coverage there and no reason to build it,” he said.

“Second, in large-scale emergencies, the wireless telephone systems can be damaged, or if they survive, access can be blocked by heavy subscriber use.

“Third, in many situations, we require broadcast capabilities, such as push-to-talk, one-to-many communications with a number of users. Cellular and PCS carriers don't

Treasury and Justice law enforcement bureaus

The Treasury Department enforces federal laws pertaining to protection of the president of the United States and other designees, as federal laws dealing with counterfeiting, fraud (including credit and debit card fraud), forgery, smuggling, moonshining, explosives and gun law violations, and tax evasion. Treasury agents and officers protect U.S. borders from drug traffickers, smuggling and strive to protect citizens and property from the threat of bombs, arson and gun violence.

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Treasury Inspector General for Tax Administration

The Justice Department offers protection against criminals and subversion, helps to control the country's borders, works to ensure healthy competition of business in a free enterprise system, takes steps to safeguard the consumer and plays

a role in enforcing drug, immigration and naturalization laws.

The department also plays a role in protecting citizens through its efforts for effective law enforcement, crime prevention, crime detection, and the prosecution and rehabilitation of offenders.

Justice's law enforcement bureaus include:

Federal Bureau of Investigation
Immigration and Naturalization Service
Drug Enforcement Administration
Federal Bureau of Prisons
U.S. Marshals Service

Manufacturers speak out

The six manufacturers sharing the contract award had this to say:

"The contract is an endorsement of the Project 25 standard. The standard provides opportunity for competition that will bring prices down. It also provides opportunity for the public safety community to purchase equipment that promotes interoperability among different jurisdictions."

— *James Ridgell, vice president of business development for federal sales at E. F. Johnson Co.*

"We contributed engineering and participated in the Project 25 standard development to bring forth contracts such as this where multiple vendors offer equipment on a common air interface. And as a company that sells to military and to public safety, we see the standard as a good bridge between their communications systems."

— *Steve Nichols, manager of Project 25 marketing at Thales Communications*

"Our view on interoperability is a little broader than Project 25. There is a good trend from analog to digital, but most users still use analog, and after \$3 billion is spent, many analog users will remain. Our Project 25 offering uses an IP format, so we can use our network-based interoperability solution to serve legacy systems."

— *John Vaughan, vice president of wireless systems, M/A-Com*

"Standardized communications in all large private land mobile radio systems is desirable for better coordination for internal and external purposes. Coordinating communications between critical industry sectors and public safety has been an illusive goal. Standards will allow a steady migration toward such coordination."

— *Robert Small, vice president of operations at Daniels Electronics*

"Having a common, interoperable communications system among our nation's various law enforcement agencies has never been more important than it is today."

— *Gene Ray, chairman of Datron World Communications' parent company, Titan*

"Interoperability was a word no one understood a year ago. If you see our government moving toward those kinds of solutions, it might add to the confidence that so many people already have in Project 25 and interoperability. If it's one more example of someone committing to these solutions, it's a good thing."

— *Mike Blincoe, vice president, U.S. Federal Government Markets Division, Motorola Communications and Electronics*

have that capability, although Nextel and SouthernLinc are two ESMR carriers using IDEN technology that can do it," Downes said.

"Fourth, communications over cellular, PCS and IDEN depends on the proper functioning of the network infrastructure. With land mobile radio, if you and I are need to talk to each other and we're close enough, we can have peer-to-peer communications without the network infrastructure — depending on the terrain and the buildings that may be between us," Downes said.

Downes said that with the NTIA mandate for federal radio users to implement narrowband technology, the IWN will move to a fast track now that the contract has been awarded.

"The mandate read that, by Jan. 1, 2005, all VHF operations need to be working in a narrowband environment. Although we haven't officially asked for an extension, because of the change in implementation strategy and the partnership between Treasury and Justice, our implementation process will take us beyond the 2005 mandate," Downes said.

He said that NTIA is measuring how much progress federal agencies have made toward the conversion and evaluating whether they are likely to meet the deadline.

"I can't speak for NTIA, but we anticipate that there will have to be some provision to carry this process beyond 2005, but I don't know what such a provision might be or even if there will be one," Downes said.

Under the NTIA mandate, federal VHF systems that do not meet the 2005 deadline would revert to secondary status, which means they could lose their frequencies to other federal users who might come along with the required narrowband systems. Hardly anyone expects that IWN would be allowed to suffer that fate. ■

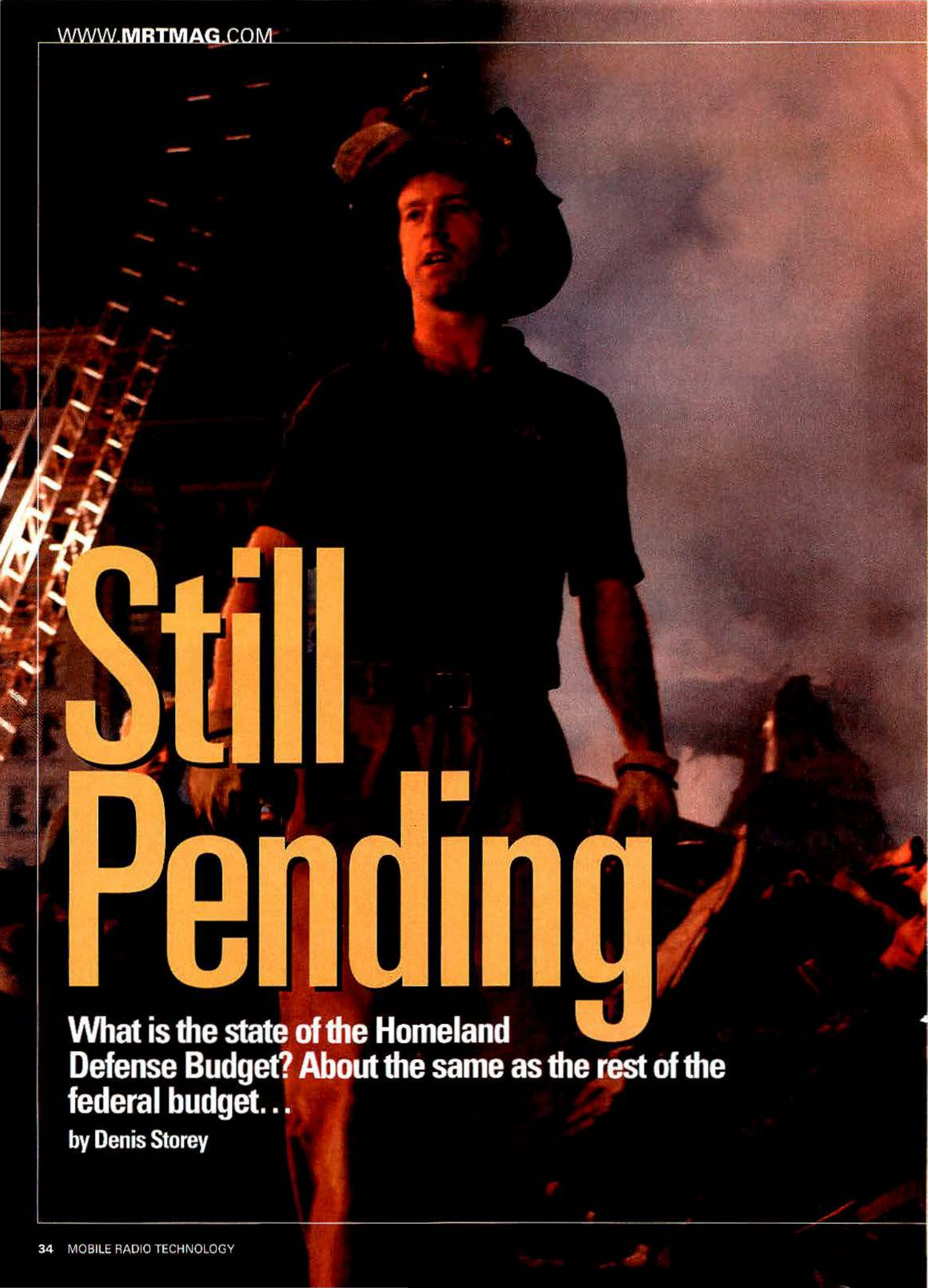
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Still Pending

What is the state of the Homeland Defense Budget? About the same as the rest of the federal budget...

by Denis Storey



After a self-imposed one-year deadline to pass a budget package to fund the new department, Congress barely kept the entire government running with a stopgap spending measure in late September. By mid-October, a compromise had yet to be reached. Now, most expect that any budget that might get passed won't emerge until after the November elections -- putting the fate of the proposed Department of Homeland Security in the hands of a lame duck Congress. Or delay everything until after the first of the year.

The anniversary of the terrorist attacks has come and gone, while senators have yet to settle on a final budget measure.

Nevertheless, researchers at McLean, Va.-based Federal Sources Inc. (a sister company to the owner of this magazine) insist that homeland security is an emerging field with the potential to breath a little life back into a wheezing Dow—and a radio communications industry that has taken its own share of hits in the cascading tech crash.

The issue of homeland security also promises the biggest shift in the president's cabinet in more than 60 years. But this new market — worth an expected \$38 billion in the pending homeland defense budget — will remain elusive to newer players. For the time being, incumbent contractors and legacy systems will rule the day, according to the experts at Federal Sources Inc.

Despite that, the federal budget had grown considerably with the return of the deficit — fueled by increased defense spending and the pending birth of the Department of Homeland Security. As such, information technology spending is up — while maintaining a similar share of the budget.

Specifically, homeland security IT spending at the federal level is expected to focus on enterprise architecture, wireless communications, data mining and biometrics. At the state level—where the White House has asked for \$3.5 billion for first responders—infrastructure expansion is predicted. Locally, spending will probably focus on first responder technology.

And the local level is where the debate intensifies. Mayors across the nation demand that involvement in spending decisions — rather than remain at the mercy of state disbursement. Several mayors are asking that \$2.5 billion be sent to cities directly. In Denver alone, according to the *Rocky Mountain News*, experts estimate \$3 million will be needed to prepare for an attack — with \$500,000 expected for an upgraded emergency operations center.

Researchers at FSI explain that a portrait of a splintered market emerges from all these facts and figures—a marketplace that includes 30,000 municipalities and political subdivisions. And from that cacophony of buyers, the Federal Emergency Management Agency rises. FEMA is expected to lead the way in managing grants to states for homeland security—grants that will most likely focus on the role of the first responder.

Experts also insist that plans are in the works for a coordinated strategy among federal, state and local governments—but that remains a long-term goal.

— continued on page 36



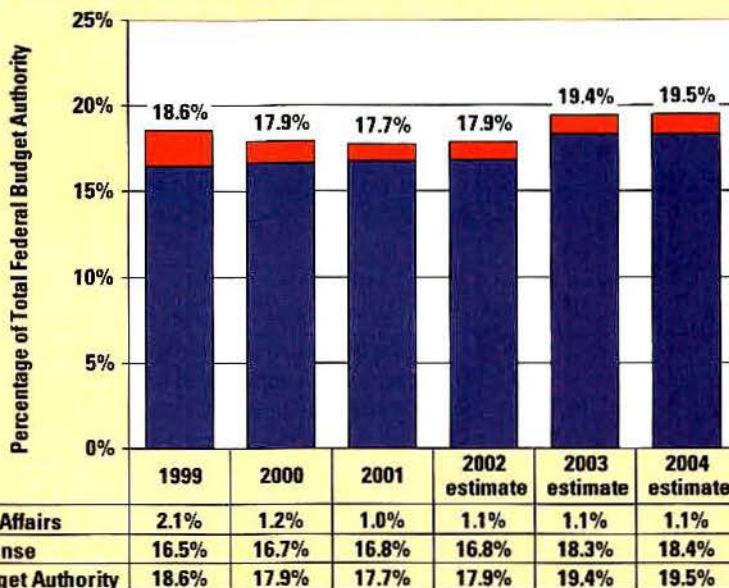
A wartime national security budget

As Congress and the White House gear up for a possible Iraqi invasion, an already climbing security budget is expected to swell even further. Needless to say, the federal deficit is back.

DoD Budget Authority:

'02: \$350B
'03: \$396B
'04: \$405B

vs. <\$300B
in recent
years



Source: OMB

Federal IT spending and budget trends

As a part of the growing federal defense and security budgets, information technology spending is expected to climb as well.

DoD and Civilian
percent shares are
maintaining their
50% -50% share

Compound Annual
Growth Rates (CAGR)
for the period shown:

Civilian = 6.5%
Defense = 7.2%
Combined = 6.8%

Actual spending
exceeds budget
estimates:

2001 -'02 Budget: 1%
2001 -'02 Actual: 5.2%



Source: FSI Analysis, OMB

Proposed Department of Homeland Security

President Bush's proposed Department of Homeland Security presents the largest proposed consolidation of federal agencies in more than 50 years. The new cabinet-level department would encompass a dozen current agencies and command a first-year budget of nearly \$40 billion.

Component agencies

Treasury	Justice	Transportation
Secret Service	INS	USCG
Customs	Border Patrol	TSA
	Office for Domestic Preparedness	
	Domestic Emergency Support Teams	
Energy	HHS	FEMA
Lawrence Livermore National Lab	Strategic National Pharmaceutical Stockpile	Entire Agency
	Public Health Emergency Preparedness Office	
DoD	Commerce	NIST
National Communications Systems	Critical Infrastructure Assurance Office	Computer Security Division
Agriculture	GSA	FBI
Animal & Plant Health Inspection Service	Federal Protective Service	Natl. Domestic Preparedness Office
Plum Island National Disease Center	Federal Computer Incident Response Center	Natl. Infrastructure Protection Center

Proposed IT budgets

Agency	2003 IT Budget	Dept. of Homeland Security Division
INS	\$481.6 M	Border and Transportation Security
Customs	\$462.4 M	Border and Transportation Security
USCG	\$230.3 M	Border and Transportation Security
TSA	\$215.0 M	Border and Transportation Security
FEMA	\$175.6 M	Emergency Preparedness and Response
Secret Service	\$38.4 M	State, Local, & Private Sector Coordination

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The Wireless Marketplace

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➤ LAS VEGAS CONVENTION CENTER, LAS VEGAS

CONFERENCE PROGRAM

Keynote Speaker:

Ambassador Richard Butler, former arms inspector to Iraq

➤ HOMELAND SECURITY

Homeland Security—Where the Money Is, and How to Get It

The president's budget request would provide \$3.5 billion per year for the next four years to "first responders" in their homeland security work. Much of the money will be distributed through grants from Federal departments such as the Federal Emergency Management Agency. Public safety agencies need to know how to apply for grants, and vendors need to know who gets the money to target sales efforts.

Homeland Security Budget Blues: Don't Go Overboard

Billions and billions of dollars sounds good, but just how far does it go? The president's budget proposes \$3.5 billion for first responders, annually, for four years. Maybe \$1 billion, or maybe much less, will go to communications systems. When you slice the money thin, various agencies may receive amounts ranging from thousands to a few millions of dollars, not enough in most cases for entirely new communications systems. Reality check: Use just the right incremental improvements to substantially increase communications capability.

Homeland Security—Outlook and Forecast

Consulting companies and trade associations have been in the business of tracking federal spending and looking to direct it toward their clients and members since long before homeland security became an issue. First, a look at where the first responders money is coming from. Second, a view from an organization that wants most of it to be directed to local agencies.

Homeland Security—What Congress Wants to Provide You

The big picture on Homeland Security starts at the top. By the time of IWCE 2003, there may be a cabinet-level Department of Homeland Security. Already in existence is an Office of Homeland Security in the White House. And in Congress, it's the Select Committee on Homeland Security in the House of Representatives. Hear from senior staff about priorities and funding for Homeland Security initiatives.

Homeland Security—Washington, DC communications

Public concern for safety in the nation's capital led to the CapWIN Project to improve coordination and information sharing among public safety and transportation agencies

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and organizations in Maryland, Virginia and the District of Columbia. The project has national implications in technology transfer including image/video transmission and the inclusion of transportation applications in an integrated system.

➤ TRANSPORTATION AND UTILITIES APPLICATIONS

Air and Motor Transport Communications Alternatives

Some companies still see value in two-way radio communications systems, while others have moved away to other alternatives. Here's what's behind the choices for some of the nation's largest carriers.

Public Safety/Utility Partnerships offer cost savings and coverage advantages

Utility companies and public safety agencies have similar requirements for radio communications, which have led to partnerships in which they share a common radio system. Advances in network-based infrastructure make sharing easier than ever.

Economics of Digital Technology

Wide-area radio networks sometimes use analog, sometimes digital, and sometimes variations. What's behind the choices can involve proprietary protocols, population density, kinds of customers or business served.



Utilities as SMRs

One of the more spectacular collapses of a radio communications strategy for utility companies can be found in the ruins of the Securicor Wireless and National Rural Telecommunications Cooperative alliance that sought electric utilities to become SMRs on 220 MHz. Some multimillion dollar systems were built, only to be abandoned. But changes are coming, and utilities may yet find opportunity in this small VHF band.

➤ INTEROPERABILITY

Wireless Public SAFETY Interoperable COMMUNICATIONS Program—Project SAFECOM

Project SAFECOM wants to help federal, state and local agencies boost wireless communications interoperability. As the managing partner of SAFECOM, the U.S. Department of Treasury and its federal partners are responsible for achieving interoperability across public safety entities. Here's where help from the government begins.

Where Interoperability Starts

Communications is only part of the interoperability equation. Inter-agency cooperation holds the key to true interoperability. Top city officials, such as mayors and city managers, have the ability to draw the police, fire and emergency medical service providers together to plan their operational interoperability.

Interoperability on Wheels

Public safety agencies without network-based or console-based radio interoperability can use mobile command centers fitted with cross-connect switches and multiple radio technologies to link responders' radio communications together on-site.

Lessons Learned From 9/11

Current officials won't talk much about it, in part because of pending litigation, but a long-standing lack of incident command coordination and communication between the New York Police Department and the Fire Department of New York contributed to a possibly avoidable loss of life in the collapse of the New York World Trade Center. New York Times reporters found that most radio systems worked well, with the possible exception of the fire department's radio system, and that both operational and radio communications deficiencies had been identified but left unresolved since the 1993 terrorist bombing of the World Trade Center.

2003 IWCE

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More Lessons Learned From 9/11—The Pentagon

A separate, but related, disaster faced public safety agencies in Arlington, VA, where a hijacked jetliner crashed into the Pentagon on Sept. 11, 2001. Although radio communications interoperability worked well during the first five or six hours of the response, as responders from greater distances arrived, problems arose.

REGULATORY/POLICY

10:00am-10:50am

Wireless E9-1-1 Update—What's It Going to Take?

Where some wireless carriers are dragging their feet or blaming their vendors for delays, others have stepped up to the plate to deliver enhanced 9-1-1 services the way the FCC and public safety agencies expect.

Musical Chairs—Got a frequency? Change it! Dance the 800 MHz shuffle!

As this is written, no one knows exactly what decision the FCC will make in an effort to resolve the interference from Nextel and cellular carrier signals to public safety and other radio communications systems in the 800 MHz band. Whatever the decision turns out to be, this session will explain the ramifications. Bring your lunch if you'd like to continue the discussion into the lunch hour.

Now, Exactly When Is it We Get The 700 MHz Band?

The 700 MHz band is heavily encumbered, meaning that TV stations still occupy channels that would have to be vacated if the frequencies are to be converted for use by public safety agencies. A combination of government policy about broadcasting and FCC regulation of radio communications affects the availability.

What Canadian government policy and regulation means for Canadian airtime service providers, public safety agencies and homeland security.

Canadian operators who attend IWCE face problems that are similar to those of their American counterparts, yet the specifics vary because of different spectrum allocations, regulatory initiatives and government policy. Public safety communications are organized somewhat differently, and coordinating homeland security with the United States has implications for Canada.



How federal policy and FCC regulation have shaped technology, product development, and purchasing by federal and public safety agencies.

Two federal government regulatory mandates are shaping the marketplace: Project 25 and narrowbanding. With P25 mandated for the 700 MHz band and narrowbanding mandated for all federal users, options for end-users become clear, if not limited.

PUBLIC SAFETY

Digital Technology—Is It Worth the Cost?

The dollar figures sometimes can be staggering; in the hundreds of millions for modern digital radio communications systems. Digital radio serves government entities big and small, yet some make the decision to go digital, and others remain analog and even upgrade their analog systems. Consultants and officials connected with agencies making choices explain the economic realities.

Fighting Fire With Radio—The 2002 Wildland Fire Season

Last year's wildland fire season was one of the worst on record. Radio communications plays a key role in managing firefighting efforts, from logistics to the front line. When the locals call for help, the National

Interagency Fire Center handles everything. And its responsibility for providing radio communications equipment and people to install it goes beyond firefighting.

Wideband Mobile Data Choices Multiply

Public safety agencies need high-speed mobile data for modern software applications and database access. Sending data over networks designed for voice often is too slow, as are some of the alternatives, such as CDPD. The 700 MHz band wideband data channels hold promise, but other choices are available now

BUSINESS

Making Dollars With Airtime Systems

The perennial death knell for the airtime system operator continues in the face of competition from Nextel's radio-cellphones and from the pure cellular and PCS carriers. But many dealers, from "mom-and-pop" size to some of the larger operators, find ways to compete on and off the turf occupied by wireless carriers. For some, multiple-site networking holds the key.

How To Sell to Government Agencies

Many small communications businesses miss out on good revenue by not going after the business of government agencies. Sometimes they are not aware of the opportunities. Other times, fear of "red tape" outweighs the lure of would-be profit. When you understand the processes used by government purchasing departments, you'll be prepared to respond in the most effective way.

Your Future In 700 MHz Spectrum, and maybe a little 220 MHz, too.

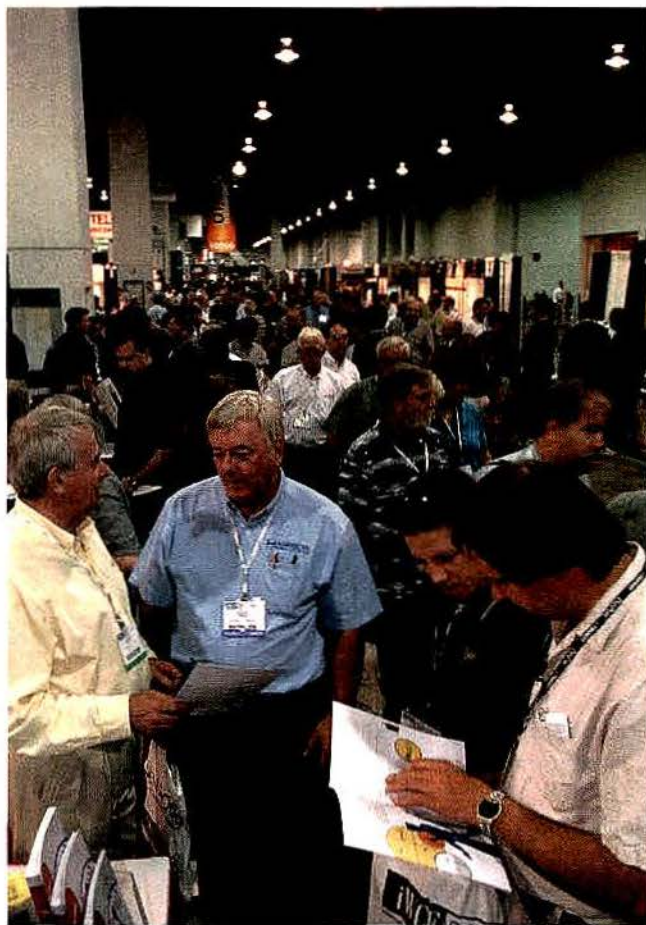
By the time of IWCE 2003, the scheduled product introduction date for 700 MHz Guard Band two-way radio equipment will have passed. It's time to get down to generating new sources of business revenue by building private and airtime service systems in this band. Only one Band Manager licensee and two vendors have announced plans to offer spectrum and products, so let's turn the floor over to Access Spectrum, Motorola and Microwave Data Systems (MDS) to learn what opportunities are at hand. Bonus: 220 MHz alternatives/opportunities.

BUSINESS

The Cost of Ensuring RF Safety

Just as with any other area of health and safety, RF radiation requires that an organization address how they deal with the issue. An RF safety program is the minimum requirement for both demonstrating and achieving compliance for any organization that has personnel, visitors or contractors that may visit or work in areas with RF field levels at or above the FCC's Maximum Permissible

Exposure limits for General Population/Uncontrolled exposures. The reasons for implementing an RF safety program should be obvious: protection of personnel, compliance with regulations and reducing liability. What is involved in developing and implementing an RF safety program? What does it cost? What else is involved? And equally important, what does it cost if we don't develop an RF safety program? These are all important questions; anyone that must deal with significant RF field levels should know the answers to these questions.



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Officers pick up the beat

Florida police officers realize less can be more with radios

When it comes to communications and records management, police in Winter Park, Fla., benefit from having some of the most up-to-date computerized technology available.

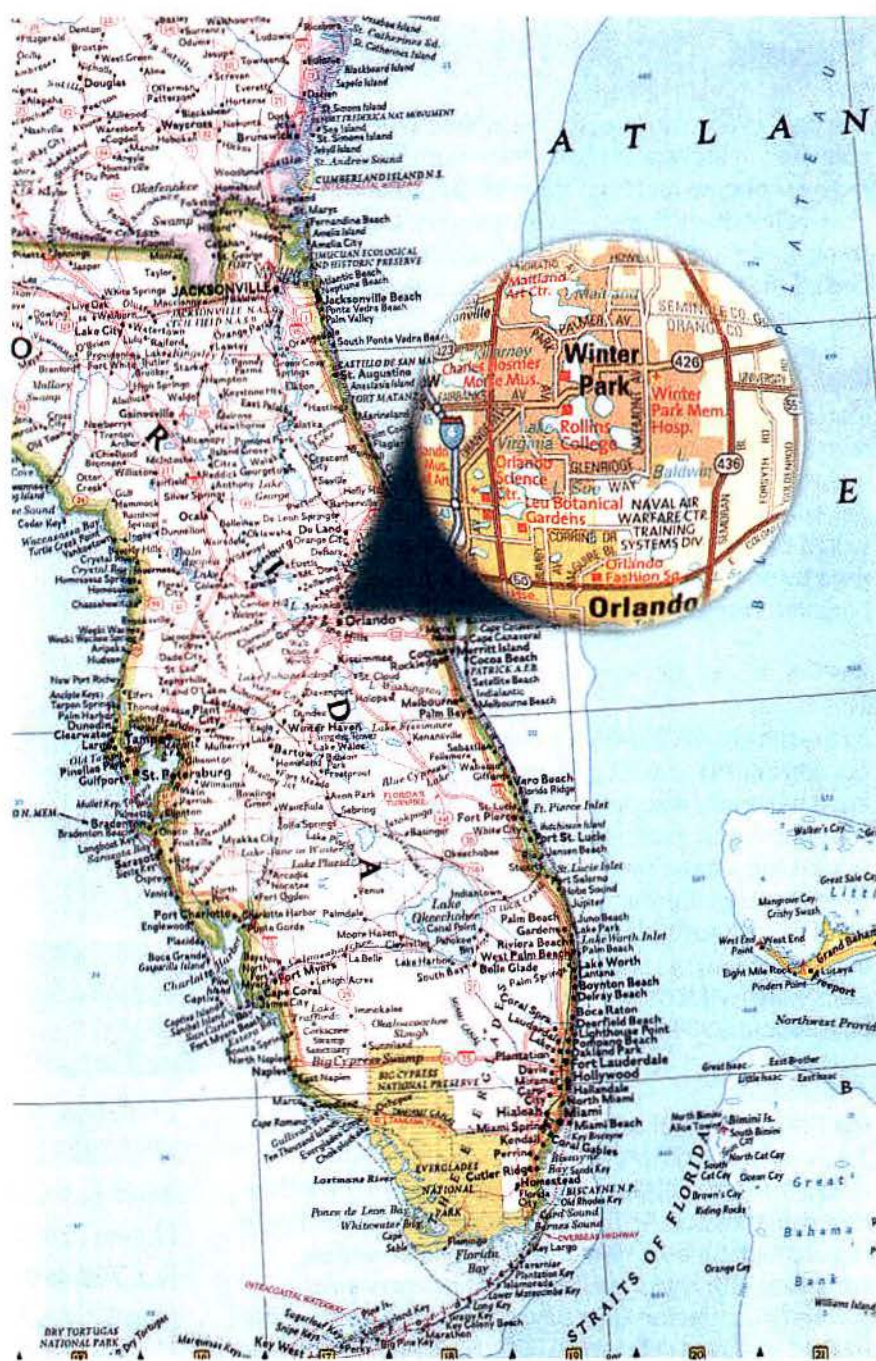
"What officers like the most is the least amount of writing," said Winter Park Police Department Deputy Chief Bill McEachnie. "It makes them and their supervisors happy, and it frees them to be available for calls rather than being occupied at a desk writing reports. They like the instant access to databases for license plates and wanted persons from their computer. It not only allows running more tags, it frees dispatchers from listening to as much radio traffic."

Winter Park's experience follows the conventional wisdom that police departments offer better service when their officers spend more time on the street. The quicker they can reach the field upon beginning their shifts and the longer they can stay on the street, the better.

Radio communications, computerized dispatching, automatic vehicle location and records management all play important roles in giving police officers the necessary vehicular resources.

With an integrated system, they have access to information from local, state and federal databases. They can communicate with dispatchers and officers in other cars. They can complete and submit reports from the street.

"We are one of the relatively few police departments whose officers prepare police reports on the computer and transmit them over the air to the supervisor. In turn, the supervisor approves the reports and sends



them directly into the records. The sergeant doesn't have to go through two reams to approve a report – it's done with a click on the computer," McEachnie said.

McEachnie described the Winter Park Police Department as one of the finest equipped departments for its size in the country. Highlights include an indoor shooting range with computer-controlled targets,

"When integrated with the computer-aided dispatching, records management can copy location information and unit dispatch times automatically."

a mobile command post, an armored personnel carrier, boats for patrolling the city's lakes and take-home cars for each of the 81 sworn officers.

By March 2001, every officer who didn't already have an assigned computer was scheduled to have one.

Winter Park doesn't necessarily deploy all of the computer-based technology described in the following information that describes some of the available technology.

Police departments that use some of the latest dispatching software find that officer safety improves with the display of current statuses for each vehicle and active incident. Computer-aided dispatching can be configured to offer immediate incident and unit status updates and database inquiries on one screen.

Communications center efficiency improves with the use of mobile data computers and terminals, access to E-911 call data and state and federal computers, and the use of alarm panels.

Planning can improve responses, yet an effective response depends on access to the plans. Computerization gives fast access to location information for hazardous materials, mutual aid, precautions and key-holders.

Where jurisdictions allow, law enforcement, fire, and emergency medical service

vehicles can be dispatched from one screen. With records immediately available, redundant data entry can be eliminated.

Although voice contact with dispatchers often makes an important difference, other routine communications go faster without dispatcher involvement. Officers' use of integrated mobile data terminals or laptop computers allow making inquiries from their vehicles, receiving copies of dispatch and location information, and updating their status without radio contact with dispatchers.

Many communications centers set up their own codes for dispatch information to minimize dispatcher keystrokes. Online communications within the system send messages from dispatcher to dispatcher, vehicle to vehicle, and dispatcher to vehicle for voice-free contact that prevents unauthorized scanners from intercepting agency communications.

Creating a comprehensive location master database makes incident histories, location descriptions, precautions, floor plans, key-holders, alarms, premise names and cross streets available to CAD or records management programs.

Individual jurisdictions can create screen maps to show active incidents in the dispatch center.

Automatic location verification not only applies to vehicles, it can be programmed to show locations by alarm numbers, premise names, addresses, intersections and phone numbers. It can use an audio feature to search for misspelled street names.

A dispatcher's judgment is indispensable, but computerization can offer a dispatcher multiple beat and response plans, and can recommend units for dispatch based on the type of call, location, and unit availability.

Integrated systems are available to handle standard dispatch, call-taker dispatch, single-agency dispatch, multiple-agency dispatch and multiple-department dispatch operations.

Making warrant information available through the system helps officers to track local offenders. Information retrieved from the records management system can be distributed to the field.

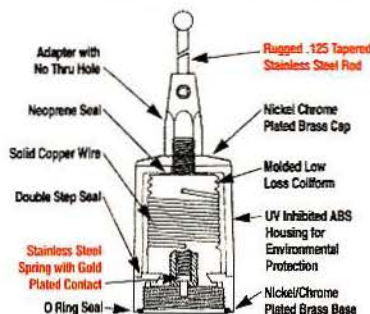
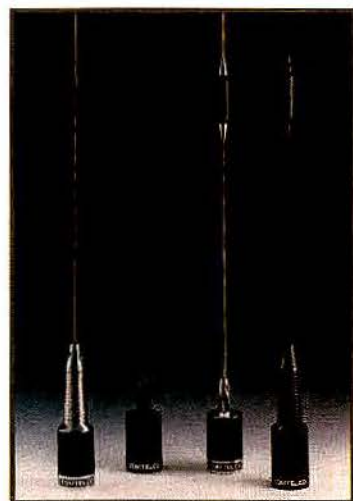
When hazardous materials are involved in a response, special instructions can be

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MOBILE RADIO TECHNOLOGY 43

delivered from the Department of Transportation emergency response guide for hazardous materials.

Sophisticated records management enables law enforcement agencies to record the greatest amount of incident information with a minimum of effort from law enforcement officers. Recording multiple charges for each incident and tracking detailed information in all incident-based reporting categories allows an agency to report

required crime statistics to state and federal agencies automatically.

Records management that tracks warrant, "be-on-the-lookout" and hazard information increases officer safety. Records management tracks the evidence chain of custody by recording property information, including who checked the item in or out of the property room and when it was released or returned.

Records management can summarize

and analyze criminal activity within a jurisdiction and detail how an agency responds to criminal activity by providing investigative analysis reports.

Some systems allow user-defined entry screens to change field names to match an agency's terminology. Comments can be added to fields to explain requirements for those fields, helping to set up case reports to print in a specified way.

Automatic data entry tables can be used to contain the most current crime reporting information required by the FBI and various state regulations. The automation standardizes the tables across multiple departments in an agency. Using alphanumeric codes makes them easy to remember.

Incident-based reporting can be automated with entry screens programmed to ensure that IBR information is entered correctly. Information can be entered about everything that may be involved in an offense, including domestic violence, drugs, documents, assaults on police officers and special homicide circumstances. Files can be separated among juvenile and adult offenders to ensure that confidential arrest records of juveniles are automatically separated from those of adults.

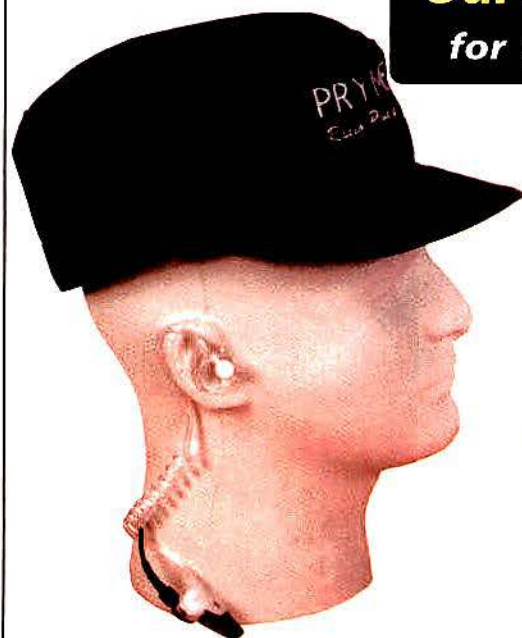
Records management can provide automatic warnings about potentially dangerous people and can quickly access hazard, modus operandi or crime specialty information. It facilitates criminal case management to follow a case assignment audit trail that specifies everyone involved with each case, indicates the case disposition and alerts supervisors to the need for follow-up reports.

Records management can maintain secured files of drug informants, rumors, hearsay and confidential information. With automatic cross-referencing, it can connect cases involving the same suspects, vehicles, locations, weapons or similar modus operandi using reference numbers. It can track information concerning the charge, warrant type, bond type, bond amount, service attempts, people involved, aliases, associates and vehicles.

Towed vehicles, discretionary funds and property registration numbers can be tracked through records management.

When integrated with the computer-aided dispatching, records management can copy location information and unit dispatch

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Additional integration can allow court employees to update warrant and citation information accessible by dispatchers and officers when the court employees update their cases.

To let officers use standard IBR entries, information from the records can be downloaded onto a laptop or pen-enabled computer.

They can complete incident reports in the field, and at the end of their shifts, automatically transfer incident reports to the

Browsers can be compatible with TCP/IP, CDPD, Electrocom, Dataradio, M/A-Com, Motorola and other communications protocols. Storage can be made available for thousands of messages sorted by time or by subject. Old messages can be recalled, edited and re-sent.

Partially completed forms retain data until the user clears or transmits the form, or exits the application.

A browser's audible alerts provide officers with indications of incoming messages. A distinct sound can be applied to each mes-

"The sergeant doesn't have to go through two reams to approve a report. It's done with the click on the computer."

records, as it is done in Winter Park.

Some computerized systems provide street intersection maps for accident diagrams, and allow officers to use computer pens to draw maps that aren't already in the system.

In Winter Park, these accident reports have to be entered on a stand-alone computer in the office because Florida jurisdictions have to use a state form that isn't yet on the city's system.

Combined with bar code scanning, records management tracks evidence and property inventory. McEachnie said that Winter Park probably would acquire bar code readers before long.

He said that the police department's property and evidence section uses computers to track evidence and to give reminders of purge dates when evidence no longer is required.

But he said he has seen bar code readers used in other jurisdictions, and that they make it easier for the clerks to track and store property and evidence.

Including a mobile data browser can improve mobile data functionality through real-time distribution of supplemental information.

A browser's graphical user interface can provide multiple navigation paths to forms and application functions.

An officer can have access to application functions and information through interfaces tailored to a department's preferences and an agency's system configuration.

sage priority and type. Audible messages can be customized.

A mobile data browser makes it easier to access federal, state and local databases. Preformatted NCIC and NLETS-compatible screens provide access to public safety databases.

A browser expands on the capabilities of most CAD systems. It provides optimized data entry and review screens for all queries and responses supported by CAD.

In Winter Park, McEachnie said that the advantages of computerization include speed and access to information.

"The disadvantages become apparent when it doesn't work. Then it frustrates everyone. There are so many subsystems and components to the system that when one goes down, it affects all of the other systems. But it's great when it works, and it works almost all of the time," he said.

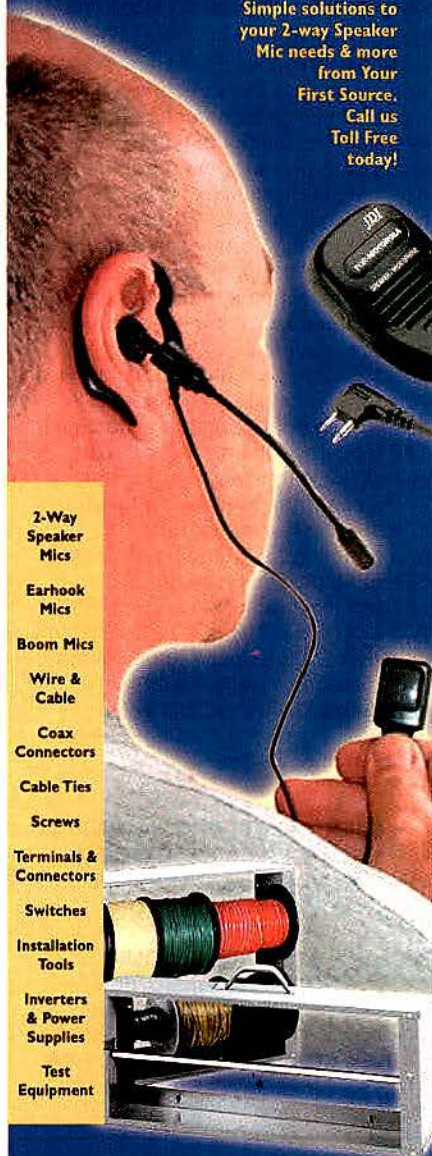
Computerized systems are so complicated that McEachnie said that the days of a department having its own system and maintaining it with sworn officers are over.

The city's IT division is responsible for all of city's computer systems, and the division has assigned someone on a full-time basis to the police department for maintenance and troubleshooting.

"Maintaining the system and troubleshooting it requires expertise in many disciplines. Integrating communications with computers and connecting all the information takes someone who is technically oriented," McEachnie said.

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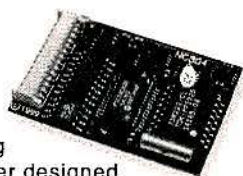
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MOBILE DATA

Winter Park Emergency Communications Center

The goals of the Winter Park Emergency Communications Center include handling calls for service in a timely, professional, and compassionate manner through training and experience, using the latest technology and techniques in providing public safety communications to the city, participate in and solicit state-of-the-art training, seminars, and practices to obtain the highest possible level of expertise.

The Emergency Communications Unit is responsible for providing immediate, accurate, and comprehensive dispatching in response to 911 and other requests for police, fire, EMS and city service. The unit also provides reliable communication with other public safety agencies at the local, state and national levels. Using a computer-aided dispatch system, enhanced 911 system and an 800 MHz radio communications network, unit personnel receive and respond to all citizen requests for emergency service and accordingly dispatch the appropriate assistance.

Supporting staff includes, one communications manager, three administrative coordinators, nine full-time operators and four part-time operators. One of the administrative coordinators and three of the full-time operators are considered fire department personnel with the remainder of personnel and activities falling under the police department.

The communications center handles an average of 107,000 events yearly. These events can be broken down into roughly 23,000 Police Case Number Assignments, 5,000 Fire Run Number Assignments, 67,800 Phone Calls, and 88,700 Computer Entries and Inquiries.

Achievements

The Emergency Communications Unit continues to augment its staff by utilizing communications dispatchers from other law enforcement agencies on a part-time basis to fill in when full-time city dispatchers are not available. The unit is in the implementation of a new Windows 95 based environment computer-aided dispatch system. The

new computer-aided dispatch system is tied to mobile data computers in the uniform patrol vehicles that will enhance the communications path of events occurring in real time in the city as received in communications. In conjunction with the new CAD system, the Unit is employing a digitally map driven program that will display information from Global Positioning Satellites to provide Automatic Vehicle Location identification of Police patrol units and active events occurring in and around the City that is displayed both in Communications and to field units. The Unit received and implemented four new Telephone for the Deaf Devices at each dispatch station to be in compliance with Federal Department of Justice Regulations and a new Dictaphone Software driven recording system through the use of the 911 telephone share fund.

Advances

The Emergency Communications Unit will coordinate the enhancement of communication services with the implementation of the new Computer Aided Dispatch System, Unit and Event Display Product, and Mobile Data Computers. The Unit has implemented a new Intelligent Answering Point telephone system at each dispatch station, a 911 Call Management System, and a Network Clock Integration through the use of the 911 telephone share fund to enhance the statistical, time stamping, and technological aspects of telephone communications and call handling. The Communications Manager continues to solicit to utilize the 911 telephone share fund to maintain the City's state-of-the-art equipment in providing service to the clients of the City as well as disaster preparedness in the area of Emergency Communications. The Unit will also continue to increase City participation and representation at various meetings and seminars of the communications associations to maintain the City's awareness of technological and administrative advances as we move into the next century. Lastly, the Unit will solicit involvement by the Community through the Leadership Winter Park Tours, Citizens Police Academy, and involvement in 911 education.

Source: Winter Park Police Department

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Emergency upgrade

Mobile communications can be a real lifesaver



Strapped to a gurney in an ambulance headed for the emergency room, a pre-hospital patient isn't thinking about the ambulance's radio communications.

He isn't thinking about how radio communications facilitated a quick response to a call for help, how it may have relayed vital signs and medical advice between the ambulance's medical responders and an emergency room physician, or how it protected the privacy of his medical condition and records.

Emergency medical service demands the obvious: high levels of first responder train-

ing, modern ambulances and medical equipment.

But, in addition, it requires mobile communications that supports service delivery and complies with patient information confidentiality required by the Health Insurance Portability and Accountability Act of 1996 (HIPAA).

Huron Valley Ambulance, Ann Arbor, Mich., is about to upgrade its mobile communications by using mobile data on a public wireless network to augment its voice radio communications.

HVA is a nationally accredited, nonprofit regional ambulance service covering all or part of eight southeast and south central

Michigan counties with a fleet of 70 vehicles.

For example, in Jackson County, HVA acts as a secondary public safety answering point, with call center staff providing screening and pre-arrival medical instructions to 911 callers.

"The benefits are tremendous. Jackson City-County residents receive medical information from the highly skilled and trained staff from Huron Valley at no cost to Jackson taxpayers," a statement on the Jackson County Emergency Dispatch Division Web page reads.

Jerry Zapolnik, HVA's vice president of support operations, said that the new mobile data system would use mobile computers



"With all of the various options, we are very well covered for both mobile and portable coverage. As with any coverage, though, it could always be better."

— Jerry Zapolnik

connected via the Nextel Communications IDEN radio communications network.

"It is my expectation that we will be able to reduce the voice traffic by 25 percent to 40 percent. At this time, we have no intention of discarding our current voice network and relying on the Nextel network for voice communications," Zapolnik said.

For voice communications, HVA uses several private radio networks on various frequencies.

Most of the company's ambulances and other transport units are dispatched via an 800 MHz systems operated by county governments.

In some outlying areas, HVA uses a VHF channel, and in some other parts of its service area, HVA uses a conventional 800 MHz

Working Conditions

Emergency medical technicians and paramedics work indoors and outdoors, in all types of weather. They do considerable

and violence from drug overdose victims or mentally unstable patients. The work is physically strenuous and stressful, involving life-

or-death situations and suffering patients. Nonetheless, many people find the work exciting and challenging, and enjoy the opportunity to help others.

EMTs and paramedics employed by fire departments work about 50 hours a week. Those employed by hospitals frequently work between 45 and 60 hours a week; and those in private ambulance services, between 45 and

50 hours. Some of these workers, especially in police and fire departments, are on call for extended periods. Because emergency services function 24 hours a day, EMTs and paramedics have irregular working hours that add to job stress.

kneeling, bending and heavy lifting. They risk noise-induced hearing loss from sirens and back injuries from lifting patients.

EMTs and paramedics may be exposed to diseases such as Hepatitis-B and AIDS,



Source: Occupational Outlook Handbook, U.S. Department of Labor, Bureau of Labor Statistics.



This image represents the type of navigation mapping that Huron Valley Ambulance will be using on the Digital Dispatch MC1700 mobile computer.

channel for communications.

"With all of the various options, we are very well covered for both mobile and portable coverage. As with any coverage though, it could always be better," Zapolnik said.

HVA uses voice for most of its communications.

The company uses alphanumeric pagers to send call information to the emergency medical service crews stationed with their vehicles at locations chosen to reduce response time.

Zapolnik explained that the pagers do not provide an acknowledgement of receipt of the information by the crews and presents some coverage problems outside the metropolitan area.

Along with the mobile data upgrade, Zapolnik said that HVA hopes to use a GPS functionality to improve mapping and routing information for the emergency medical service crews.

Digital Dispatch Systems, Richmond,



British Columbia, Canada, is supplying HVA with MC1700 mobile computers for the company's bus transportation vehicles and ambulances, and is handling the system integration with the Nextel network.

The mobile computer includes a GPS receiver and touch screen, and runs the Windows CE operating system.

It also is equipped with Personal Java, which allows developers to build cross-platform applications more easily.

The computer's open architecture allows it to be integrated with HVA's computer-aided dispatch.

Digital Dispatch has been known for its taxi dispatch systems, and it also provides systems for the courier, road assistance, airport shuttle, paratransit and transit.

It is making a transition to also providing overall systems integration, project management, technical consultation, system installation, training and customer support for public safety dispatching. ■

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UTILITY APPLICATIONS

Shotgun wedding

Rural electric utility weds 220 MHz and FM radio

Whenever a storm or accident causes a power outage after hours in northeast Nebraska, at least four members of the Northeast Nebraska Public Power District's duty crew are ready to respond.

When a power outage call comes, the utility's toll-free telephone number automatically feeds the call over the radio to the four duty crew members who can determine immediately who is closest to the trouble and what response is required. Instead of return-

ing to the home office in Wayne, Neb., they can make plans to resolve the problem over their radios.

"That method works, but not as well as we want," said Mark Bressler, the load management supervisor for NNPPD.

To improve the power company's mobile communications and lay the foundation for a radio network to include other Nebraska power companies – and enable interoperable radio communications among them – Bressler has contracted DX Radio Systems, Sun Valley, Calif., to build a 220 MHz radio system for the electric cooperative.

NNPPD is installing a three-site, four-channel system using "extremely narrow-band" FM and MPT 1327 trunking. MPT

trunking is a digital format that uses analog voice. With only 30 units on the system, it's small, but Bressler envisions building a larger network to achieve radio interoperability with other Nebraska electric utilities.

In fact, the project has its roots in an effort to bring radio communications together between NNPPD and another power district when they merged four years ago. One of the districts uses VHF, the other, 800 MHz. Bressler saw using 220 MHz as a way to bring them both together.

The power district measures 90 miles east to west and 50 miles north to south. A central station at the company headquarters in Wayne ties together three remote sites with dispatch and data communications.



With only four channels per site, why did NNPPD choose trunking? Bressler said that an ability to pass data and the future option for vehicle location and automatic meter reading led to the choice of equipment with MPT 1327 trunking, which can support those applications.

"We're trying to follow up on the interest in 220 MHz and trunked radio that NRTC generated a few years ago."

"The radios have data ports and display screens so the dispatcher needn't call until the truck operator can be reached. Instead, the dispatcher can leave a message or a job order on the display. When the truck operator returns, he doesn't have to call in," Bressler said.

"In the state of Nebraska, the Midplains Energy Services Alliance, a company formed by the Nebraska electric cooperatives, has purchased frequencies in the 220 MHz band, and we'll use some of those. If this new, cutting-edge radio system looks and works as well as it is supposed to, we will try to get the rest of the Nebraska electric cooperatives to consider building similar systems. Then we would have interoperable radio communications with our neighboring districts," Bressler said.

Bressler explained that the process of workers throwing switches on transmission lines that run from one district to another would be facilitated with interoperable radio communications. He explained that switches need to be thrown under both normal and stormy conditions. Previously, the worker would call the office and communicate with other workers through the regional dispatcher. With the 220 MHz system, the workers would have a direct link.

"The line worker in the truck has to notify the office to throw the switch. We have switches in both 115 kV and 69 kV substations. As yet, they cannot be operated remotely by our workers, and have to be operated remotely by our power supplier, Nebraska Public Power, from its dispatch center in Doniphan, Neb. Even then, steps have to be taken by someone standing in front of the switch panel. Sometimes the switching process involves two or three

trucks," Bressler said.

Another advantage of the new 220 MHz system stems from the microwave system used to link the sites. The microwave will carry system audio, data backhaul and billing data between the billing center and the general headquarters in Wayne. In the

future, Bressler said, automatic meter reading would tie it all together.

Sharp, a senior systems engineer with DX Radio heads the turnkey construction project for the NNPPD.

"This project has a long history. NNPPD became interested in 220 MHz trunked radio four years ago when the National Rural Telecommunications Cooperative started selling Securicor Wireless products," Sharp said. (See "Behind the Scenes At 220 MHz" inside this article.)

At the time, Sharp and other DX Radio employees were working for Alexander Utility Engineering, San Antonio, Texas, where they were engineering 220 MHz systems for various utilities that participated in the NRTC program.

"We're trying to follow up on the interest in 220 MHz and trunked radio in general that NRTC had generated a few years ago," he said.

"The NNPPD system got delayed because of Securicor's inability to supply a hand-held unit. The power company need-

Fylde Microsystems, Blackpool, Lancashire, United Kingdom.

Brian Seelde, director of Fylde Microsystems, said that both systems from Securicor Wireless and DX Radio Systems use the MPT open standard.

"Securicor chose a novel modulation system called 'linear modulation.' This technology was, like many, a step too far. It worked OK in the laboratory, but in the field, it had many problems that just could not be solved," Seelde said.

Seelde was one of the authors of the MPT format, and he said that it is "the global leader for open trunking standards. It offers a price/performance ratio that cannot be matched by any other standard. The MPT standards are free and can be downloaded from many sites on the Internet, including www.fyldemicro.com or the U.K. government site at www.radio.gov.uk."

For subscriber units, DX Radio Systems supplies units made by ADI Communications, Taichung, Republic of China, under the direct control of TMC Radio, Melbourne, Australia. In April, TMC Radio purchased the intellectual property and manufacturing rights of Simoco's SRM9000 mobile and SRP8000 portable series of conventional and MPT 1327 products. DX Radio Systems has exclusive rights to the TMC Radio units in the United States and Mexico to sell them under the DX Radio name.

When Sharp went to work for DX Radio Systems, he suggested to Bressler that NNPPD consider finishing its project using the DX Radio 220 MHz FM trunked radio products.

"An ability to pass data and the future option for vehicle location and automatic meter reading led to the choice of MPT 1327."

ed telephone interconnected portables for nighttime dispatching. Once the portable became available, it was found to work poorly. And then, Securicor fell apart," Sharp said.

Sharp added that AUE had looked at the possibility of DX Radio providing the infrastructure, designed and manufactured by

What's unusual about DX Radio System's technology is that the FM signal is confined to less than 10 kHz bandwidth, somewhat less than the narrowband standard of 12.5 kHz. This channel bandwidth plan extracts more usable channels from the available channel blocks than the wider bandwidth does, when a licensee aggre-

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UTILITY APPLICATIONS

gates the original 5 kHz channels to work with FM.

"There is no defined emission mask for the narrowband products at 220 when you aggregate bandwidth and lay out your own channel plan. The only requirement is that you protect adjacent channel blocks in the same manner as an emission mask F would do, if it were used. We're using 1.6 kHz deviation. You lose some signal-to-noise ratio as the modulation index goes down, so there is a slight degradation on range, but it is not that noticeable," Sharp said.

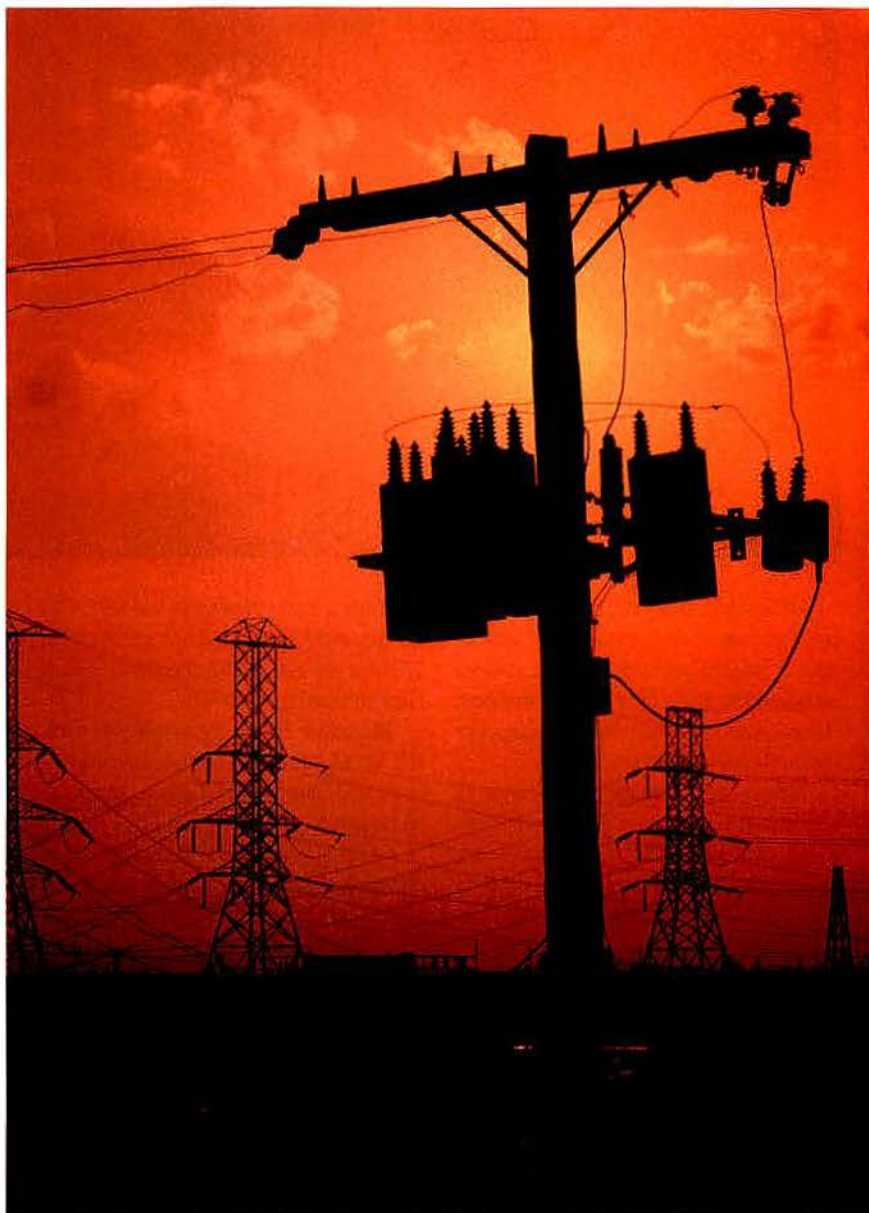
He said that the NNPPD system is DX Radio System's first turnkey project built for the customer as a usable, operational product. But the company already has

been operating two test systems, one for a year, and another for six months, for utility customers.

Sharp said that the system is MPT 1327-compliant with integrated voice and data, and PSTN and PABX connectivity. Access to the radio channels by users can be controlled with various levels of priority, allowing the system owner to tailor it to fit traffic requirements.

The system also supports pre-emptive emergency calls, so if a user is in trouble, he is guaranteed access. Another user would be thrown off to connect this type of call.

The system allows placing wide-area group calls. Sharp said that, in the United States, "people want to emulate party-line



Behind the scenes at 220 MHz

Northeast Nebraska Public Power District started its 220 MHz effort four years ago through a program offered at the time by the National Rural Telecommunications Cooperative, Herndon, Va., and a radio manufacturer, Securicor Wireless, New York. The program was intended to supply electric utilities with radio frequencies for statewide operations, together with equipment and a plan for using the frequencies both for a utility's internal communications and for airtime sales to other users as a profit-making enterprise.

tor of wireless systems. "The only thing we're promoting is to use 220 MHz frequencies to support their core business, which is telemetry for SCADA or automatic meter reading, or two-way radio dispatch for their fleets."

Saul said that NRTC has licenses available for single-site, paired channel systems.

"We don't promote anyone's equipment, but we know that Microwave Data Systems offers 220 MHz equipment for telemetry.

For two-way radio systems, Tait Mobile Radio has an FM product with a number of

radios, so they do group calls rather than radio-to-radio calls."

As for MPT 1327 acceptance, he said "there more MPT 1327 systems on the planet than all trunked radio systems combined, but they're all outside the United States."

Sharp said the NNPPD might install AVL in six months to a year.

Moreover, once mobile data terminals are installed in the power company's trucks, the utility is planning some other data applications, such as remote job entry.

Although NNPPD is working with a software vendor that supplies turnkey software for coops, the utility hasn't yet selected an MDT vendor.

Sharp said that a lot of electric coops are building independent voice and data systems to replace antiquated equipment. He described them as mostly conservative organizations that prefer a proven technology; thus, he sees their next move as involving trunked systems.

"These systems fit their unique requirements, including data. Their radio systems go underutilized most of the time, until there is an outage or emergency. Then they carry extreme traffic levels where only trunking can handle the multiple calls and groups," Sharp said.

With MPT 1327 as an open standard served by 31 manufacturers of subscriber units around the world, Sharp said that NNPPD is putting in infrastructure that is unique to its manufacturer, but the utility can use any subscriber unit that is MPT 1327-compliant.

Bressler has gone through the 220 MHz experience once already with NRTC and Securicor and found his project stalled because the portable radio product first couldn't be delivered when promised, and once delivered, didn't work as well as he needed it to.

Although he recognized a certain degree of risk with 220 MHz, he said, "We're comfortable with DX Radio Systems, and the Simoco [TMC Radio] mobile and portable products. There's risk, but it's worth taking."

At DX Radio Systems, Bill Cody, the company's operations manager, said, "We're looking forward to 'kicking butt' with MPT 1327. We're working with a lot of the coops. And the NNPPD system is being staged in L.A. right now." ■



NRTC's three-pronged program — frequencies, internal communications and airtime sales — failed to gain widespread acceptance and dwindled away. Most utilities that built systems with Securicor Wireless equipment eventually dismantled them.

Although NRTC no longer encourages its members to sell airtime and it no longer promotes two-way radio equipment sales, its members still can purchase the rights to use 220 MHz frequencies through the cooperative.

Several manufacturers are offering equipment options, but now utilities make their own equipment arrangements without NRTC involvement.

"We primarily support the utilities' internal communications," said Bill Saul, NRTC's direc-

capabilities, both conventional and MPT 1327 trunked, and Motorola has announced an FM 220 MHz two-way radio product with LTR and PassPort trunking," Saul said.

Microwave Data Systems is in Rochester, N.Y. Tait Mobile Radio's North American office is in Markham, Ontario, Canada. Motorola's headquarters is in Schaumburg, Ill.

DX Radio Systems, Sun Valley, Calif., offers conventional and trunked equipment on all frequency bands, and the "extremely narrow-band" FM, 220 MHz, MPT 1327 trunked radio equipment.

Another manufacturer, BizCom, Fort Lauderdale, Fla., offers amplitude-companded single-sideband conventional and trunked two-way radio equipment designed for the 220 MHz frequency band's original 5 kHz channels.

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Emergency communications support

Getting into gear

Communications departments internal to government structures are getting serious about their role of providing emergency communications to "customer departments."

Many forward-thinking (and usually better-funded) communications departments have been slowly building their emergency resources for years.

Even the late entrants have begun to develop some kind of plan that meets customer expectations within financial and technical constraints.

Many forward-thinking (and usually better-funded) communications departments have been slowly building their emergency resources for years.

Level of support — When developing an emergency response plan with the customer, the level of support the customer needs and can sustain must be clearly defined. It could differ greatly from agency to agency.

Counties with a large tax base will be able to provide more, compared to a small

municipality. Support services may range from handing out fresh batteries for portables to offering wide-band public safety network access via microwave for voice, data and radio applications.

Final authority — You have to establish who within the customer department has the authority to call for deployment of the emergency equipment and support team. Because emergencies often occur at inconvenient times (such as after hours), false rollouts on overtime can be expensive and disheartening to the support team.

Command officers at the scene of the incident might have a different perspective than officers at headquarters. While HQ management calls for emergency support deployment, authorities on-scene may want to clear the area and keep things as uncomplicated as possible.

The last things they might want to deal with are those they feel they don't understand or need (such as communications technicians with their vehicles, trailers and other equipment).

Specifying limitations — Be sure the customer understands the inherent limitations of the support equipment.

For example, if mobile microwave equipment is transported to a fire staging area, the fire department staff has to be made aware of the requirement for a line-of-sight path from that location to another microwave site within their network.

They need to know that placement of the support equipment is critical and, once



This mobile microwave trailer was deployed as a microwave repeater. The solid dish antenna was aimed at an existing public safety hilltop microwave site where an identical trailer was positioned. The grid antenna is aimed at a staging area. The trailer was positioned on the rim of a dam that offered line-of-sight to both path endpoints.

established, it cannot be moved without disrupting communications.

Broadband: Microwave it

If a line-of-site path does exist between the incident location and a coordinate microwave site, mobile microwave equipment offers a highly useful resource.

Microwave radios, multiplex and two-way equipment can be housed inside a truck, van or trailer. Various configurations of microwave antenna masts can be attached to the side or roof of the vehicle to establish a temporary link to the coordinate site.

If the equipment is mounted permanently inside the vehicle, a trailer is often the best option.

Motored vehicles can be more expensive, and they require additional maintenance.

An on-board air-conditioner and standby generator allow the vehicle to be cool and self-contained.

As a practical matter, many small generators intended for motor homes or trailers

During an emergency deployment, the best position available for the microwave trailer and antennas may provide a less-than-optimal path.

aren't designed to operate non-stop for days or a week at a time. Because an emergency may require communications support for an extended period, arrange access to a large, continuous-duty generator as soon as the deployment is ordered.

Many large customer departments such as fire department and law enforcement agencies have this type of heavy equipment on-scene or available.

The least expensive option for the microwave radios include unlicensed, spread-spectrum units for the 2.4 GHz or 5.8 GHz bands. Different manufacturers and models offer variations in system gain and bandwidth.

These compact, lightweight radios and antennas have no special reputation for providing long-term, reliable communications. But emergencies are not permanent; thus, many consider these units to be an

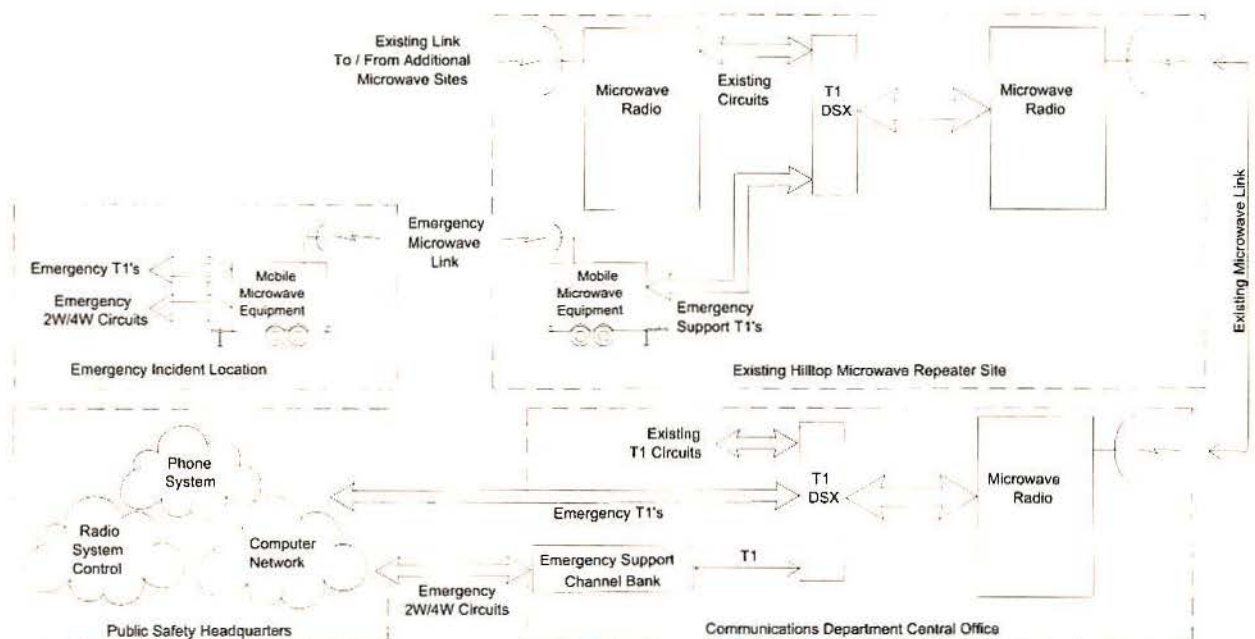
acceptable, cost-effective option.

A more reliable but expensive alternative is a licensed, fixed-frequency microwave radio. If the budget allows, redundancy could be used for even greater reliability.

During an emergency deployment, the best position available for the microwave trailer and antennas may provide a less-than-optimal path. Loss caused by trees, terrain features or other obstructions, along with unwanted reflections, can reduce the signal at path endpoints.

Path length is also a limiting factor and an important consideration when evaluating the various types, makes and models of microwave radios referenced to support expectations.

Greater system gains are achieved with narrower bandwidths. A single T1 spread-spectrum radio may have an advertised



Emergency communications can be provided to many locations with a mobile microwave link.

Figure 1. In this example, signal flows from a public safety headquarters to a remote incident location. T1, discrete two-wire, discrete four-wire (4W) circuits or a combination dedicated for emergency use can be connected into the communications department central office.

path length of 60 miles, where the DS-3 version is limited to about 15 miles.

If the customer department requires only a single T1, there would be no good reason to go wild with bandwidth while imposing severe limitations on path length.

Figure 1 shows how the signal flows from a public safety headquarters to a remote incident location.

In this example, T1 and/or discrete two-wire (2W) and four-wire (4W) circuits dedicated for emergency use can be connected into the communications department central office (CO).

Once at the T1 transmission level, the emergency traffic is cross-connected through a DSX panel into the appropriate microwave link. The traffic must be routed to the remote microwave site that provides optimal line-of-sight communications to the incident location.

Sufficient bandwidth must be made available on the existing microwave network to allow for the additional emergency circuits. If not, it will be necessary to prioritize and "bump" existing traffic for the sake

The traffic must be routed to the remote microwave site that provides optimal line-of-sight communications to the incident location.

of the emergency.

When the deployment order is given, one mobile microwave vehicle is moved to the incident location, and the other is taken to the optimal remote microwave site. The mobile equipment at the microwave site is connected into the existing public safety network through a DSX panel.

The mobile equipment at the incident location connects to customer equipment that can be housed either within the mobile microwave vehicle or in additional mobile vehicles (such as planning and strategy trailers) provided by the customer.

If the emergency deployment configuration resembles that of Figure 1, the communications support staff is broken up into three groups:

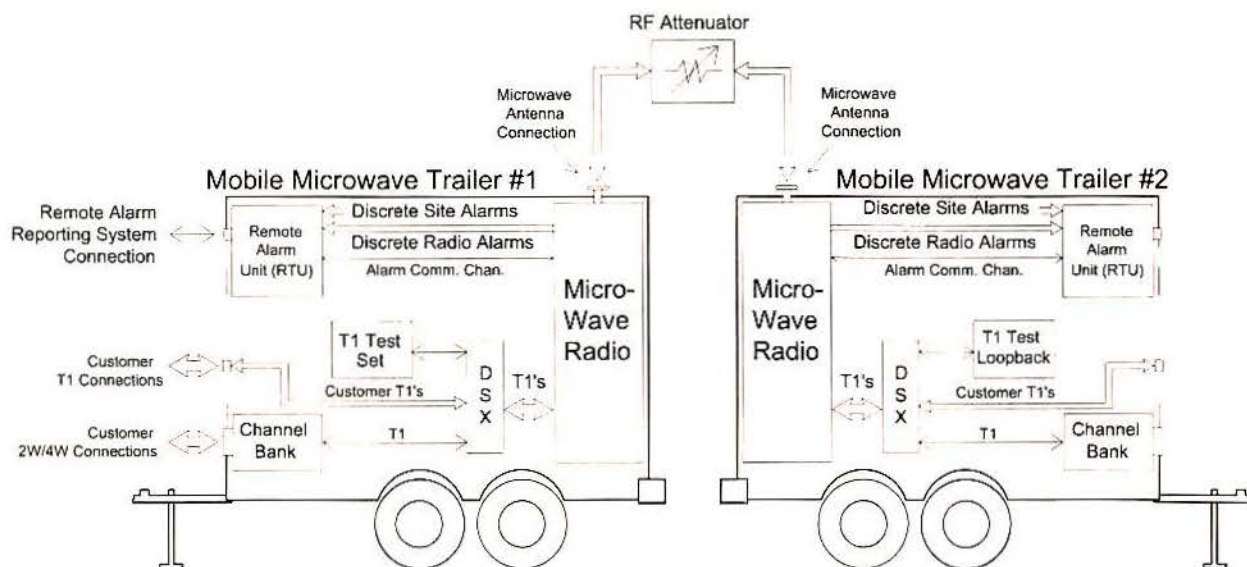
- one at the public safety HQ/communications department CO location
- one at the optimal remote microwave site
- one at the incident location.

If emergency circuit connections between the HQ and the CO are accomplished in advance and left ready for use, human resource requirements are usually least at that location.

More than one individual should be assigned to the remote microwave site for safety reasons because this involves transport of heavy equipment in often less-than-optimal locations and environmental conditions.

For the same reason, more than one should be assigned to the incident location.

Additionally, since work at the incident location involves direct interaction with the customers, it is helpful to have one of the on-site support staff be either a working supervisor or senior technician. This pro-



While in storage, the equipment can be monitored for performance and failures

Figure 2. Two microwave trailers (one for each end of the emergency link) are stored side-by-side and left powered-up in lieu of periodic setup and teardown to verify readiness. The radios in the trailers communicate with one another through a transmission line and an in-line RF attenuator. The level of attenuation is set so that the radios are within just a few decibels of the receiver bit-error rate threshold.



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vides the customer with a "representative" of the communications support team and their department.

Wise allocation of human resources in the initial deployment stage will help ensure adequate support later in the form of fresh replacements as the incident plays out.

Waiting in the wings

One challenge of retaining emergency resources is making sure they are working and ready to go when needed.

Periodically verifying the operational status of all support equipment can be an unwanted task, particularly if it involves a considerable amount of time to set up and tear down.

An alternative is to keep the equipment running while waiting for deployment.

Most microwave networks employ an alarm monitoring system that automatically polls each remote communications site

one-at-a-time. Any facility or equipment alarms are registered at a centralized maintenance location.

When connected into this system, alarm points within the mobile microwave vehicles also can be monitored.

Figure 2 shows an example of two microwave trailers (one for each end of the emergency link) stored side-by-side and left powered-up. The radios in the trailers communicate with one another through a transmission line and an in-line RF attenuator. The level of attenuation is set so that the radios are within just a few dB of the receiver Bit-Error-Rate (BER) threshold.

If transmit power or receiver sensitivity degrades, a corresponding microwave radio alarm will be generated and registered at the centralized maintenance location. Facility alarm indications such as an indoor HIGH TEMP alarm can be used to monitor operation of the trailer air conditioner.

Continuous T1 performance testing is

accomplished by leaving a T1 test set running in one of the trailers. The test set injects a primary rate bit pattern into the associated microwave radio. The T1 signal is looped back in the other trailer such that the test set can receive its own recovered pattern, less significant problems, such as dribbling bit errors, to be identified.

Public concern has become heightened regarding government agency preparedness for disaster or emergency response.

Feeling the pressure, many communications departments are beginning to discuss levels and methods of support more seriously with customer departments.

With available funding, customers can find a practical broadband solution to the challenge of providing emergency communications support through the use of mobile microwave equipment. ■

Jeff Ashley is a communications technician and writer based in Ventura, Calif.

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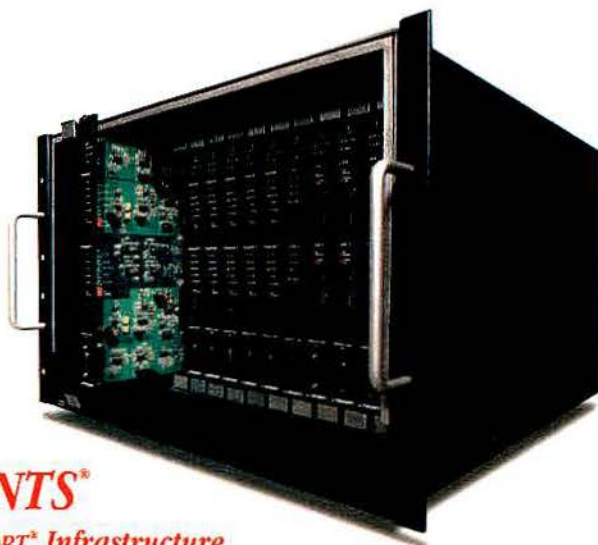
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Pass interference

Statutes, precedent favor non-cellular operations

The publicized FCC rulemaking regarding protection of public safety's operations at 800 MHz has caused rebanding, auction and technical proposals to be placed before the agency. The only thing missing is the basic analysis of the legal status of interfering operators.

This analysis is necessary because, amid the noise and chatter about what should be done, the industry has ignored the issue of why something needs to be done.

The need arises from flawed premises promoted by interfering operators who suggest that operation of low-site cellular systems is authorized by their respective licenses.

This is not wholly true, and this half-truth has, to some extent, guided the agency thus far.

The flawed premises regarding the existing operations of the interfering CMRS carriers appears to begin with the overly simplistic approach that since those operators possess authorizations to operate on those channels over the respective geographic areas and since the equipment employed has been type accepted by the commission, then all such operation is legal.

This is untrue, and the pedestrian logic that produces this conclusion has undermined the agency's exercise of rightful authority to protect the operation of legitimate systems.

A simple example shows that the premise is wrong: If an amateur radio operator uses his type accepted equipment to engage in unauthorized broadcasting, this activity is not within his authority and subjects the operator to serious penalties. It doesn't matter if the channels upon which the operator is transmitting are fully authorized for ama-



FCC headquarters

teur radio operation and the equipment is operating properly. This operator is deemed a "pirate broadcaster," and the commission's records are filled with the serious punitive reaction to such activity, regardless of whether the offender's operation causes

It is the purpose of this Act, among other things, to maintain the control of the United States over all the channels of radio transmission; and to provide the use of such channels, but not the ownership thereof, by persons for limited periods of time, under

"If cellular licensees and Nextel choose to operate low-site systems, they do so at their own legal peril if the resulting transmissions create harmful interference."

harmful interference or otherwise injures any other person or their business.

This example reveals that whether an activity is authorized — i.e. legal — is not confined to the issue of whether the operator holds a license or the equipment is type accepted. The relevant issue is whether the operation is within the boundaries of the operator's authorization.

The underlying statutory authority rests with 47 U.S.C. §301, which states in relevant part,

licenses granted by Federal authority, and no such license shall be construed to create any right, beyond the terms, conditions and periods of the license. No person shall use or operate any apparatus for the transmission of energy or communications or signals by radio ... or when interference is caused by such use or operation with the transmission of such energy, communications, or signals ... upon any other mobile stations within the jurisdiction of the United States, except under and in accordance with this Act and with a license in

that behalf granted under the provisions of this Act.

The interference created by low-site cellular operations is suffered by other licensees most often due to the interfering entities' production of energy on channels for which the interfering licensee does not have authority to transmit.

For example, the production of intermodulation products is the creation of energy spurs on channels upon which the operator(s) does not hold authority. Since the operation is unlicensed, it is unauthorized, i.e. illegal.

Licenses tell the story

The subject cellular licensees and Nextel cannot point to language on the face of their respective licenses which states, in effect,

Licensee is authorized to produce unintended radiation in amounts sufficient to be detectable by adjacent channel licensees and licensees operating on channels upon which intermodulation products occur, which harmful radiation detecting licensees must be made to suffer until such time as the parties might informally and mutually agree to a resolution of any harmful interference that results from licensee's unintended radiation.

Yet, the rebanding plans that speak to accommodating Nextel's continued use of its architecture suggest that Nextel's operation is unfortunate, but authorized.

Conversely, analog SMR operators, utility companies, public safety licensees, B/ILT licensees, and other affected licensees will search in vain upon the face of their respective licenses for language which states, in effect,

This license is conditioned upon licensee's agreement to accept interference from unauthorized transmissions operating outside the authorized passband of other licensees' systems until such time as the interfering operator engages in extensive testing for undetermined periods. Licensee may be subject to all costs arising out of its participation in all such testing and any modification demanded by the interfering operator to accommodate the operation of the interfering operator's system.



Nextel Communications President, CEO and COO Tim Donahue

This illustration demonstrates why the dictates of Section 301 are important for directing the efforts of FCC and the industry.

The basic idea is that no person may operate radio apparatus in a manner that exceeds the technical parameters of that person's license.

Further, that all such operation is, by its very nature, unauthorized. Since most of the interference that the rule making seeks to correct is the result of transmissions of energy outside the authorized passband,

which appears on the offending party's license, the industry should assist the FCC in recognizing this fact and the legal ramifications of this basic principle of spectrum management.

History should guide the FCC

What is somewhat troubling is that the FCC has to be reminded of something that it has used countless times to rein in technically improper or simply injurious operations.

For example, although cable television

systems require authority, that authority does not extend to a right to create harmful interference arising from signal leakage across a system (In the Matter of Charter Communications, VI, LLC, DA 02-2137, released Sept. 4, 2002); and the Enforcement Bureau is quick to point out in its letters to errant licensees, "[o]peration outside the scope of authorization creates a definite danger of interference to other radio communications services and may subject the operator to the penalties provided for in the Communications Act of 1934, as amended" (Letter to Communications Unlimited Inc., EB-01-CG-134, March 20, 2001).

That the requirement to operate within

cessation of such transmissions and, in accord with 47 U.S.C. §503 (b)(1)(A), demand a forfeiture for continuous violations due to that operator having "willfully or repeatedly failed to comply substantially with the terms and conditions of [its] license," which action would be consistent with 47 U.S.C. §333 which states that "[n]o person shall willfully or maliciously interfere with or cause interference to any radio communications of any station licensed or authorized by or under this Act or operated by the United States Government."

That the production of such interference outside the terms of the interfering party's license also gives rise to affected operators'

land mobile station is using facilities with typical desensitization characteristics." Public safety operators and analog SMR licensees are employing facilities with typical desensitization characteristics and the problem has been directly linked to operation of the interfering CMRS stations.

In fact, the language within the Interference Order that created the rule is directly on point to the issue of 800 MHz interference,

Interference to land mobile facilities from TV signals may be caused by desensitization of the land mobile receiver by the TV signal, generation of intermodulation products and radiation outside the assigned TV channel. In

The manner in which an operation occurs must reflect the technical parameters, including passband, appearing on the respective licenses. If it doesn't, it's illegal. Period.

technical parameters is one of the most basic tenets can even be seen when an entity is operating in a less-than-complete mode, e.g. the operation of antenna facilities at heights substantially below the authorized AGL, resulting in the commission holding that substantial construction had not occurred and the license was canceled (see In the Matter of Mobile Communications Service Inc., 14 FCC Red 19471, released Nov. 22, 1999).

Analogously, the commission denied a request for Special Temporary Authority when the applicant wished to operate at a bandwidth greater than that appearing on its license, because no equipment was available that would limit the bandwidth to 6.25 kHz as authorized (Letter decision to Hilltop Communications Inc., Ref. No. 7110-19, Oct. 26, 1999), even though the requesting party stated that no licensed system would be affected and that all such authority would be accepted on a secondary basis.

The FCC said, in effect, "the face of your license says you may operate a system with a 6.25 kHz bandwidth and no more, no matter what."

What, then, would happen if the FCC applied the same logic to 800 MHz interference?

The agency may immediately order a

right to make formal complaint in accord with 47 U.S.C. §208 is also obvious.

Not the first time

The FCC has often adopted rules to protect licensed operations, even when the potentially interfering parties do not operate facilities under the same Rule Part as the potential victims of that operation.

For example, 47 C.F.R. §90.257 sets forth specific technical and operational rules to protect licensees of television channels 4 and 5 from receipt of harmful interference from operators of 72-76 MHz facilities. (See, also, the commission's decision In the Matter of Resolution of Interference Between UHF Channels 14 and 69 and Adjacent-channel Land Mobile Operations, FCC 91-241, MM 87-465, released Aug. 29, 1991), from which the Commission promulgated 47 C.F.R. §73.687(e) ("Interference Order"), which is the most illustrative of the previous rule makings dealing with these very types of interference.

A simple reading of Section 73.687(e)(4)(ii) shows that the matter of interference resolution has been decided. That rule section specifically directs the broadcaster to "correct a desensitization problem if its occurrence can be directly linked to the start of TV operation and the

this Notice we addressed receiver desensitization, which occurs when the extremely strong signals within authorized TV channels reach a land mobile receiver with sufficient strength to impair reception. Such impairment may take the form of decreased receiver sensitivity or increased noise, both of which, from the land mobile user's standpoint, result in loss of coverage area. We also addressed intermodulation interference, a type of interference that occurs when strong signals mix with other signals within or external to a land mobile receiver to produce spurious signals (intermodulation products) on the land mobile receive frequency.

Within that proceeding the Commission correctly decided that the responsibility for avoiding and correcting interference lay with the TV broadcasters.

In fact, the Commission went so far as to require broadcasters to demonstrate that proposed operations would not create harmful interference to land mobile facilities prior to commencing program tests.

In Small Business in Telecommunications' comments, the emphasis has been on technical solutions based on the statutory obligation upon licensees to avoid and correct interference. Those comments are fully consistent with past practices and the mandates of the FCC.

Although the LMCC supported the

FCC's action in the Interference Order, curiously many of its members have forgotten the lessons learned there for dealing with the current situation.

The proposals offered by the PWC in WT 02-55 have glossed over the underlying responsibility of all licensees and speak to accommodating interfering operations, or meeting those problems with the Best Practices Guide, a public relations placebo that is similarly premised on feigned cooperation, rather than the legal obligation to immediately cease the creation of harmful interference.

Some conclusions

A rational, legal conclusion to the present rule making must be premised on the dictates of Section 301 of the Act.

Application of the statute would mean that although cellularized systems may operate within a geographic area on all authorized channels, the manner in which that operation occurs must reflect the tech-

nical parameters, including passband, appearing on the respective licenses.

If the operation doesn't, it's illegal. Period.

If cellular licensees and Nextel choose to operate low-site systems, they do so at their own legal peril if the resulting transmissions create harmful interference. Conversely, if the operations do not cause harmful interference, the tree has fallen in the woods without anyone hearing it. The FCC has long tacitly approved the "no harm, no foul" rule to the byproduct emissions of RF operations.

Rebanding or relocation should not be employed until such time as CMRS operators can make a showing that operation within the agency's existing statutory guidelines is impossible for reasons unrelated to whether those interfering operators make a profit.

Since no such showing could be made, then the existing harmful interference should not, standing alone, be a basis for rebanding.

I cannot fathom why so many organizations and entities have ignored the basic rights and duties of operators in accepting or adopting proposals.

Nor can I explain why the industry would let a class of operators claim immunity to one of the most fundamental requirements of radio – to avoid and correct interference.

All I can hope is that the industry, the FCC and, if need be, the U.S. Court of Appeals, studies more carefully the law and applies it equally, regardless of size. ■

Schwaninger is Mobile Radio Technology's regulatory consultant. He is general counsel to the membership organization, Small Business In Telecommunications. Part of this article is drawn from SBT's comments filed with the FCC in its WT Docket No. 02-55 rulemaking proceeding. Schwaninger also is president of Schwaninger & Associates, a Washington law firm. He can be reached at rschwaninger@sa-lawyers.net.

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Other features include 150 to 174 MHz and 450 to 480 MHz frequency operation (model dependent), 12.5 or 25 kHz bandwidth, programmable by channel, PLL stepping at 2.5/5/6.25 kHz (VHF), 5/6.25 kHz (UHF). 47 CTCSS tones, 104 DCS codes – encode and decode, 5-tone and DTMF encode and decode, community repeater operation (Up to 16 tones/codes), dealer programmed ANI/ENI ID display, dealer programmed CW transmitter ID, dealer

programmed Time-out timer, hang timer, guard timer, BCLO and BTLO, selectable repeater or base transceiver mode, selectable local or remote mode, AC power selectable for 115/230 VAC, automatic battery backup capable (requires optional 50 Ahr Battery), and an optional internal duplexer (max 40 Watts).

Specifications at a glance:

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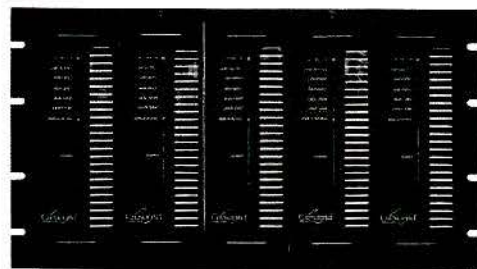
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GR300 Desktop Repeater

The compact GR300 repeater is designed to increase the range and capabilities of mobile and portable communications. The repeater has been developed to address and solve special coverage problems quickly, easily and inexpensively. It is a flexible unit designed to meet the frequency bands, power and transmit/receive requirements for a wide variety of applications including public safety, private LMR and others. The unit features a modular design that allows quick field replacement of disabled components. It offers a desktop control point operation since its small size allows the repeater to be located in office environments where dispatcher interface is required.

It can also be used for portable applications by adding front and back protective covers and a carrying handle. This makes the unit suitable for a number of portable installations such as jobsite, rental or emergency repeater applications. It supports VHF/UHF crossband operation, which

allows UHF and VHF radios users to communicate with each other. And, it offers internal mounting space for additional components such as duplexers, preselectors and battery revert modules. The unit is UL and CSA approved.

Specifications at a glance:

Frequency Range: VHF or UHF
Size (H x W x D): 10.1" x 7.5" x 0.4"
Weight: 34 lbs.
Duty Cycle: 25W @ 100%, 40/45W @ 20%
Controller Capacity: 1

Maxon SR-4000

The Maxon SR-4150V(VHF) and SR-4450U(UHF) repeaters are designed for reliable, unattended operation. The units are offered in a compact and lightweight package, and offer models for both single- and multi-user applications. A major feature is ToneLock high-performance decoding for minimizing or eliminating dropouts

resulting from weak, fading signals or high modulation signals.

The units also offer Morse code station ID and high-quality audio. The basic models, the SR-4150V and SR-4450U are assembled without a duplexer while the "DV" and "DU" suffixes include a 6-cavity duplexer. Both units offer a maximum capacity of 50 CTCSS and 104 DCS User groups (total 154 users) and weigh only 19 lbs. Other features of the devices include regenerated CTCSS and DCS codes, the ability to reserve vacant tones and codes and selectable transmitter hold time and courtesy tone. The units come fully assembled for quick and easy installation and setup.

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RF Neulink wireless diversity

RF Industries' Neulink Division has introduced a new wireless diversity receiver/transmitter that includes up to four separate receiver/antenna units powered by battery or AC current.

The diversity receiver and transmitter is designed for applications where RF interference is possible or for applications that demand uninterrupted audio and video transmission. Applications include: a police officer videotaping of domestic violence calls; air-to-ground coordination for chase and surveillance; roving security tape and video relay of suspicious activity to central secured area; extended security monitoring for expanded building facilities; and military video monitoring for security and classified applications.

The product is also being marketed for other monitoring applications, such as airport security, airplane "in-flight" activities and recording, hospital emergency rooms and critical care units, remote and battery powered film and movie studio recording, fire, paramedic and other mobile public safety applications, wireless closed circuit TV and remote news broadcasting.

The unit is available in UHF, 900 MHz and 2.4 GHz frequencies. www.rfneulink.com

DX Radio Systems rolls out 9000 series

DX Radio Systems has announced the DXM9000 series dual-mode mobile radios. They are available for various land mobile markets and compatible with the MPT1327 protocol, an international open architecture format. The 9000 series includes four different models – with unique head configurations and progressively advanced features.

The DXM9010 features a single-digit LED display and three fixed buttons. In conventional mode, the 10 channels also can be configured to Scan or Vote groups and operate in trunking mode, the radio has 10 memories that can be set up to call phone numbers, depots and groups.

The DXM9020 offers six programmable buttons and a six-character, alphanumeric starburst LCD display, along with 100 conventional channels or 250 trunked call addresses that can be alpha-tagged for phone book scrolling.

The DXM9025 is a systems-compatible, 1,000-channel alpha name mobile featuring a two-line x 12-character dot matrix LCD display, a 12-button keypad and six assignable function buttons and separate Selcall and Status lists editable from the handset.

The DXM9030 includes a seven-line x 14 character graphics display and offers the flexibility of a remote control head radio with the same 1,000-channel range, editable lists and other dual mode features as the DXM9025.

www.dxradiosystems.com

Midland unveils professional portable radio

Midland Radio has introduced a portable two-way radio for business and professional communications designed to operate on conventional user-licensed VHF or UHF frequencies.

The 80-150/400 boasts 16 channels and 5 watts of power built into a polycarbonate housing and weighs 14 ounces including the standard 1200 mAh NiMH rechargeable battery.

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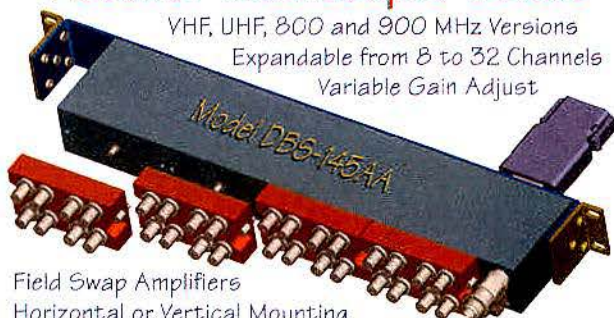
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Features of the 80-150/400 include adjustable transmitter output power by channel and scan and programmable squelch codes. In addition, each of the

16 channels can be field-programmed for 12.5 or 25 kHz bandwidths.

www.midlandradio.com

IFR launches improved spectrum analyzer

IFR announced an improved version of the 2399 spectrum analyzer designed to meet the needs of the cellular manufacturing and test market by making a higher frequency range instrument available at a lower price.

The 2399A is a color 9 kHz to 3 GHz spectrum analyzer that replaces IFR's existing 2399 spectrum analyzer. It offers a lower noise floor of -125 dBm at a price of



\$8,700—a drop of \$900 over the 2399.

The 2399A can be ordered with an optional digital resolution bandwidth filters (DRBW). The filters are generated digitally at 100Hz, 30 Hz and 10 Hz to allow finer resolution, reducing the effective noise floor by 5 dB.

The lightweight (less than 21 lbs.) unit features a large color LCD display, a fast processor and a large memory capable of storing up to 1,000 screen traces and 2,000 operational states. Its 50-ohm input can accept signals between +30 dBm and -120 dBm while providing protection up to 50 VDC. The comprehensive marker system allows as many as nine markers to be displayed at any one time, together with a marker table showing the frequency and level of each marker selected. This feature allows multiple signals to be evaluated simultaneously. In addition to Normal Markers, the 2399A provides Delta Markers, Peak Search, Peak Track, 1/Delta, Marker Track, Marker to Center, and Marker to

Reference capability.

The instrument can be ordered with a full-range tracking generator, high stability time base, and quasi-peak detectors for EMC-compatibility testing and digital resolution bandwidth filters. Its pricing at US \$9,048.

www.ifrsys.com

Cisco introduces mobile access router

Cisco Systems Inc. announced the Cisco 3200 series mobile access router, a new solution for mobile vehicular applications. The router is designed to facilitate the mobility of networks in motion—entire networks of communication devices in moving vehicles such as airplanes, ships, tanks and trains—and is designed for “always-on” connectivity.

It is a compact access router that is designed to provide security in data, voice and video communications, and seamless mobility and interoperability. Enabled by standards-based mobile IP, the router extends the edge of the IP network, delivering mission-critical applications for the defense, public safety and commercial transportation markets.

It also includes Mobile Networks Software that allows an entire network, not just a single client, to stay connected while in motion.

www.cisco.com

Site Master cable and antenna analyzer

Covering the 2 MHz to 1.6 GHz frequency band, the Site Master S113C/S114C site management tools are designed to accurately locate and identify RF cable feed-line and antenna system faults. These models are ideally suited for any experience user in commissioning and maintenance of today's wireless communication system infrastructure including VHF, cellular and GPS applications.

The system's measurement capability includes return loss, VSWR, cable loss and distance-to-fault (DTF) analysis. RF interference rejection enables accurate, repeatable measurements in the presence of high RF activity. Data analysis software enables assessment of system trends, problems, and performance in addition to professional report generation. An optional power meter is available to make power measurements quickly and easily.

It features spectrum analysis capability in addition to measurement capability, allowing technicians and field engineers to identify and solve RF system problems such as coverage, interference and other path related signal problems. Its spectrum analysis ranges from 100 kHz to 1.6 GHz.

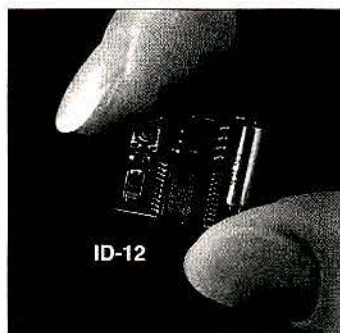
The system's models include data analysis software, soft carrying case, recharge-

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MDC-1200 is a registered trademark of Motorola Inc.

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Antenna Specialists marries technologies

The Tele-Locator Dual-System mobile antenna combines both GPS and 900 MHz technologies in a single, cost-effective antenna to offer two-way communication and GPS location services.

It allows for customers with GPS capabilities to also have two-way 900 MHz communications – without the expense and often-unwanted appearance of two single function antennas on the vehicle.

This antenna facilitates integrated voice and data wireless service along with the benefits of GPS location capabilities to provide a solution to the E911 problem for wireless phone users. For example, this antenna allows the use of an in-vehicle GPS system to identify the location while the cellular phone can be used to summon assistance. Additionally, trucking fleets are able to track their assets while having nationwide wireless communications access simultaneously.
<http://www.antenna.com/index.html>

Centurion Wireless unveils first multi-band, 3G antenna

Centurion Wireless Technologies has announced the availability of the Multi-Band Microsphere antenna.

It is designed to enhance mobile phone connectivity inside buildings. It provides simultaneous, omni-directional coverage in all major global mobile communications frequency bands including AMPS, GSM, DCS, PCS and UMTS.

The antenna offers a broad range of indoor coverage for five frequency bands covering Cellular at 806-894 MHz, GSM at 880-960 MHz, PCS at 1850-1990 MHz, DCS at 1710-1880 MHz and UMTS at 1990-2170 MHz. It can eliminate the need for multiple in-building antenna installations. The antenna offers peak gains of 2.7 to 4.5 dBi. The antenna can be mounted directly on any ceiling and its extremely small form factor ensures that once installed it is practically invisible.

The antenna can also provides carriers with an upgradeable path to 3G as these services are rolled out. In the interim, it will allow wireless carriers operating on a single frequency band to create multi-carrier networks with other service providers that accommodate the full range of different services in use by mobile subscribers. www.centurion.com

Federal Signal rolls out aviation obstruction lighting

Federal Signal, Electrical Products introduces steady-burning red aviation obstruction lights as the latest addition to its line of visual and audible signaling products.

Designed to mark tall structures that present hazards to air navigation, these lights warn pilots flying at night about obstructions such as antennas, water towers, smokestacks, skyscrapers and airport perimeter fencing.

There are three basic models – the 810S with a single lamp, 810SE with a single lamp and wiring enclosure and the 810DE with dual lamps and a wiring enclosure. An optional photoelectric controller will provide automatic lighting activation at dusk per FAA specifications. In the dual lamp units, an optional transfer relay activates the standby lamp upon failure of the operating lamp.

Units ship with 116-watt traffic signal type lamps and are rated for 8,000 hours of continual use. Photoelectric cells are rated for 5,000 on/off operations.

www.federal-signal-indust.com/Default.asp

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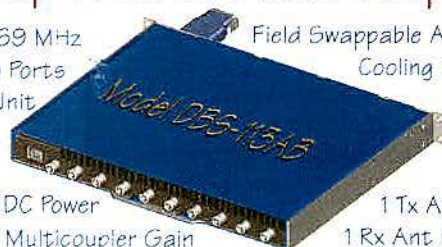
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DB Spectra #1	70	37	972-389-0595
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Federal Signal Corp	50	24	708-534-3400
General Dynamics Decision Systems	19	12	877-449-0600
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IFR Systems	7	7	316-522-4981
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Trident Micro Systems	63	30	800-798-7881
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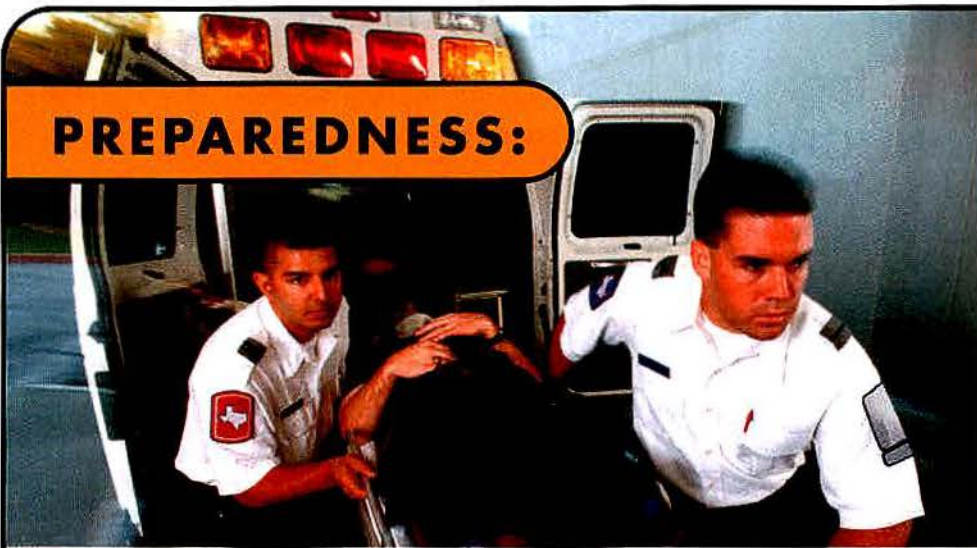
   

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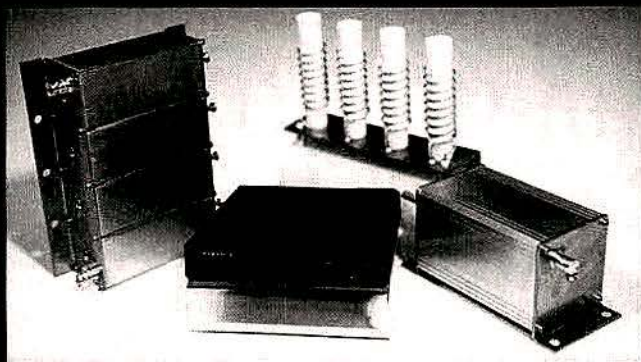
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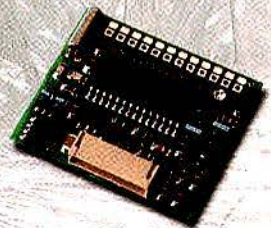
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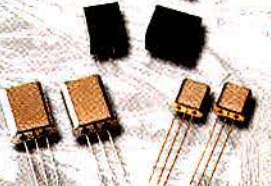
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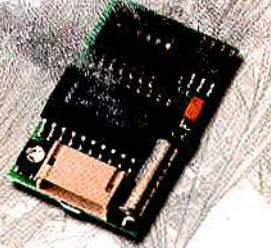
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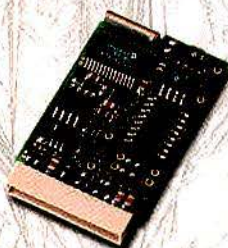
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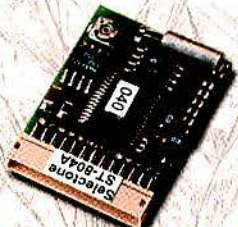
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